

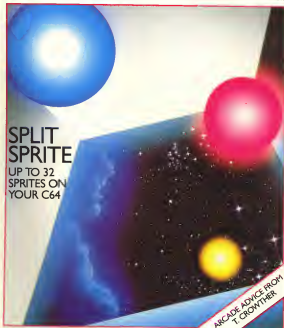
YOUR COMMODORE

AN ANGUS SPECIALIST PUBLICATION

APRIL 1987 £1.00

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YOUR C64



ARCADE ADVICE FROM
T. CROWTHER

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Wanted: a good — if not perfect — movie to watch on the first of the year. And here's what I've put together for you: a collection of movies that I think you should watch. (I'm not a movie expert, but I'm a fan.)



STORY BY: JAMES H. HANCOCK
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DIRECTOR OF PHOTOGRAPHY: JAMES H. HANCOCK
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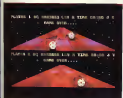
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- Double height characters on your C64



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DATA STATEMENTS

APS at School

Apex From Software is about to release the official *Grease* Hi! game, entitled *Grease Hi! - the Computer Game*. Spin off of the long running TV series about a comprehensive school, the game takes you in the part of Linko 'Gonch' Ganshaw.

The scenario is the darkened school, closed for the night. However, within the corridors of the staff room, for your Wellman's confiscated earlier during class. You cannot return without it for fear of the wrath of some teacher. So, you have to get it back. What better idea than to look into the window after everyone else has left, find your way to the classroom and check your last progress? Well, it may sound a little far-fetched but that's the general idea.

With the aid of your pal, Melle Wellman (potentially supporting the software) because he has even less brains than you, you aim to complete your duty deed by making a difference your team will go over.

The adventure has a large number of locations and various crude elements to you guide the characters with the keyboard or joystick. It should be in the shops now and is



July Jordan

£9.95 on cassette.

Also look out for these other titles, coming soon on APS to help Wellman's *Apex Grease Cyber Monkeys, World War One, Star Wars, Rastaman Roundheads and The Hunt for Red*

Orion. All are for the C64.

Reviews

Apex From Software: Private Wars, Lovers' Place, London WC2N 7BB
Tel: 01 439 0960

Miscellaneous Software

Finally a look at a few games winging their way to your local shops even as we speak.

Rebulet is releasing a new level 9 adventure for the C64 entitled *Knights Of*. It casts you as an oppressed one intent on getting your own back on the barons who have subjugated your people for generations. Some of the art depicted graphics are an impressive visual feature of the new adventure. Out now.

Arcteryx, from CRL, is due to be launched for the C64 in the spring. Continuing the theme of *Tau C64*, *Arcteryx* casts you in the top secret training school of the Gladius for dragon pilots. You have to learn to shape your own space ship, and participate in all the events needed to qualify to become a full fledged dragon pilot. It will be available on



cassette and disk at £9.95 and £14.95 respectively.

Arcteryx has a bargain package for the £18. Post Runner and Holloway in a two-games-in-one cassette for only £6.95.

Also from Arcteryx is *Killer Pig*, the latest Tony Crowther game on Commodore 64 cassette (£4.95) and

disk (£12.95). The only one features a special recipe for R-Wing rap cakes.

Shield vry, a C64 game based on the Lee Doughton thriller of the same name, will also be available for the C64 from Arcteryx in the near future. Based on the actual against Britain in World War Two, you lead the German forces in a game of strategy and action.

C64 users are still being supported handsomely by Gamma and a new release for this machine is on its way to the shelves. *The War of the Tapes*, based on the fighting fantasy series of books of the same name, combines strategy, action and unique animation. It features three action packed levels 'superb sound effects and inspiring backdrops'. Yours for £5.95.

Reviews

Rebulet, First Floor, 74 New Oxford

Severe London WC1E 4PF Tel 01 246 8538

CEB—CBA House, 9 Kings Yard, Carpenter's Road, London E13 3BD Tel 01 533 2081

Artemis 44 Lang Ave, Caversham Garden London WPC1E 8DN Tel 01 838 1441

Gordon, Alpha House, 10 Curlew Street, Sheffield S1 4PS Tel 0342 753433

Links On Line

Who says computer owners aren't connected at heart? News has recently come in of the first onk-to-onk marriage on CompuNet.

The couple are Paul Hurrell and Margaret Northey. They were introduced by Carol, Margaret's mother. She said "I was chatting to Paul on Party-Line at Christmas and he sounded a bit down, so I brought Margaret online to cheer him up."

A fine hour party line session led to a phone call and then Paul made the journey from his home town of Wintbourne near Bristol, to London-Margaret's home, where they met face to face for the first time. Soon afterwards Margaret suggested her family with a diamond and sapphire engagement ring. The couple plan to marry in about two years.

Margaret's father Chris said "When I bought a modern, I didn't happen for a wedding"

Paul summed up the couple's feelings about their romance "It's thanks to Computer. Loving 340 miles apart, we'd never have met if it hadn't been for Party-Line"

On to the more serious aspect of communications, BT's Electronic Yellow Pages (EYP) went live in early January allowing about 50,000 communicating terminals in the UK and abroad free access to a database of Yellow Pages subscribers.

Initial information covers the whole of London, Reading, Guildford, Watford and St. Albans.

In areas where the 1987 edition of Yellow Pages are not available until later in the year, users interested should ring the EYP Helpline (see Touchline) for a free copy of the user instructions.

See Also:

CompuNet 01 583 4866

EYP Helpline 0734 386229

Sports Pick

New from Activision is an Activision's Cup game, simply and appropriately titled *Snooker*.

It's a game of strategy and simulation designed to capture the thrill of competing at top level snooker competitions. Even before you start racing you have to design the best cue and set you across the finishing line first.

You can choose overall length, maximum length, forehead and waist length as well as adding wings to your cue and changing the ball material. Once you've sorted this out and made your allegiance to a particular nation then you're ready to compete.

The display is split into two halves: the top shows the prize pot over the rest, so that you can see if your

opponent is ahead. The bottom contains your progress which you need to monitor closely to get the best from your best. It's available for the C64/128 at £9.99 cassette and £14.95 disk.

Four sports games in one are available from Advance Promotions in the form of a new release entitled *Snooker Sports*. The four sports featured on the cassette for C64 are 18 Pin Bowling, Air Hockey, Table Tennis and Darts. The Commodore 64 version is £8.99 and Advance claims that all the games could stand alone at full price.

Touchline

Activision: 25 Pond St, Hammersmith, London, W6 9JH Tel 01 491 1401
Advance: 17 South Tyre, Harlow, Essex CM18 2LE Tel 0176 412441



Snooker Sports

Pocket Money

A new range of budget games has recently been launched by Midea Marketing. There are two initial releases on the new label: *X29 Fighter Mission* for the C64 and *Space 7* for the C16. Both are priced at £2.99.

X29 Fighter Mission is essentially a shoot and combat simulator. Your fighter must be flown with skill and dexterity to avoid the constant onslaught of enemy fire and have nothing to do with the way you must concentrate on displaying the enemy craft.

Space 7 is a combination of shoot 'em up action and skill and nerve as manoeuvring a large space craft through dark caverns. There are two programs on *Space 7*. The first *Galaxy*, involves a lot of shiping trying to return to the mothership. However, there are the available galactic missions trying to hinder your journey.

Star 7 is the second program where you must guide your large fuel supply vessel to stranded stations on the planet Vogan. They are situated deep underground so you need to negotiate the treacherous route through cavernous caves with change obstacles.

Midea Marketing is also launching a new label named *Building* (cost of £2.99).

The company claims to have commissioned some working original products for the new label which will have a distinct identity to complement the existing Midea/Midea £1.99 and £2.99 ranges. The first title, already in the shops, is *Feed*, at £1.99.

Drives and Data Recorders

The *Echomax 2600*, the only available alternative to Commodore's own series of disk drives, although reliable and reasonably priced, has always suffered from compatibility problems. Now *Echomax Micro* claims to have solved this.

Echomax claims that on the enhanced version of the *Echomax*, all disk drives and virtually all disk protection schemes can be handled without a problem.

Priced at £149.95 (fully inclusive) and an option to purchase with *Proton Drive* 50.70 and 10 disks for £179.95, *Echomax* reports high demand for small quantities.

At the moment supply is restricted

Recently formed Budget House, Code Masters, has just announced a competition for buyers of Code Masters games. Anyone buying a Commodore game will get an entry form to the BHK competition. All you have to do is spot the hidden code which has been placed from a screen shot of the Code Masters game *BMK Scudline*. Entries are only limited to the number of Code Masters games you buy. Entry, because the competition closes on 31 March 1987 and the prize is a 20" Sony Trinitron colour TV.

Other new games money proud games are *White Phoenix* on the *Firebird Silver* £1.99 label and *Cyber 7* on the Supermarket label from CDS at £2.99. Both are for the C64.

TrackStar

Midea Marketing: 25 Post Hill, Bedford Row, Ltd. W1, Tel. 0142 52172.

Mastertronic 4-16 Post Street, London EC2A 4UN. Tel. 01 377 8430.

Code Masters: 1 Acornway Business Centre, Acornway Close, Banbury, Oxon OX16 3ET.

Blackbird Five Miles, N. New Oxford Street, London WC1A 1PS. Tel. 01 462 4318.

Supermarket CDE, One BV, Acornway Hill, Southwood, Surrey, Surrey, GU14 0BP. Tel. 01272 122360.

The system works in the following way: a small disk is put in the case to allow the distributor's adjuster to move forward and backwards at play and stop as required. A knob attached to a threaded shaft which replaces the standard screw allowing an adjustment of 180 degrees. Scoring is also fitted for the Commodore 64 allowing the user to adjust to the nearest data signal. For the technically minded there is a DTV kit available. If you're interested, then contact the address in TrackStar for more information.

TrackStar

Echomax Micro: 81 Bridge Street, Exeter, Devon EX1 1GP. Tel. 0323 43243.

Lead-In: 25 Stratton Road, Shirley, Solihull, W Midlands B36 2EX. Tel. 021 745 4070.

Notes on Editors

Supermarket, the company which has recently supported the PET series from the beginning, has now fulfilled its recent promise to continue to provide software for these machines.

Fast Copy is a disk copying facility for the 8000 and 8250 drives which can drastically reduce the time it takes to make vital backup copies of data disks. It saves time by entering the formatting process on an already formatted disk and by copying only those blocks that have been used. Available at the low cost of £15 (ex VAT).

Star is a Basic compiler for the 8000, 8010, 8080 and 8250 computers. *Star* has been available in Europe for some time and has now been licensed to Supermarket on the UK. Compiled programs run five, 16 or even 20 times faster with *Star* and since they are impossible to alter by anyone who hasn't got access to the uncompiled original, they are also more secure.

Star costs £99 (ex VAT) and comes with a comprehensive manual. Additional versions on the same disk are only £20 extra, so for example the 8000 and 8080/8250 version would be £129 altogether.

Fast Copy and *Star* are available from Supermarket or on order from your local computer store.

Having with editors but moving in



Look

to mail order, unless you call in at one of *Echomax*'s two branches. However, *Echomax* hopes to expand availability to other outlets in the near future.

For those still struggling with data records, you may be interested in the *Lead-In* system.

the CMA Systems Software has recently published *Oxford Basic*. This is a complete CMA Basic programming environment and gives the user a full library of powerful utilities including *Oxford Analyser*, a report optimisation utility, the *Compressor* which claims to save consuming space and RAM, the *Tweaker* which introduces new commands, *On-Comp* a fast file compatible Basic compiler to give you the speed and professionalism of machine code without an assembler. The all-inclusive price is £24.95.

Tweaker

Supplies: *Procter & Gamble, Comag East, Westman, Harrow, Middlesex HA1 7JF Tel 01 881 1386*
Systems Software: 168 Worcester Place, Oxford, OX1 2JW Tel 0845 54782

Potential Millionaires Wanted

American software company MicroProse, which has recently established a UK base, is looking for

Commodore software writers with the potential to become millionaires overnight.

The man behind the hunt is Simon Barnard, MicroProse software development manager. He said "We believe that the UK has the best Commodore software writers and my job is to find them and offer them, not only money, but international recognition".

MicroProse in the US spends in excess of \$1 million on developing its software programs. However, Simon is not just looking for simulation specialists, he also wants programmers of top quality arcade games.

Simon revealed his reasons for believing that successful applicants may soon gain millionaire status. "MicroProse sits at the top of the US charts, literally for years, and that translates into a lot of requests, besides substantial advances. So I don't think it would be unfair to claim that if we can find someone who can write simulations like *Shogun* Series, they would be a millionaire almost

overnight".

MicroProse has an extensive list of simulation programs, the latest of these, due for imminent release is *Command* for the C64/128, £14.95 advance, £29.95 retail.

Command is an accurate simulation of the Hughes AH-64A Apache combat helicopter - one of the most lethal weapons in the modern military arsenal.

Command is the result of extensive research and the culmination of five years of programming and game design. It was held back from release until military helicopter pilots had actually not flown. *Command* themselves. Now the US Army want to train new pilots, attaching sensors to their helmets to measure reactions. "It

Tweaker

MicroProse: 1 Market Place, Twickenham, Middlesex TW9 1AD Tel 0895 34326

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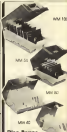
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I.Q.

More and more people are turning to games which need grey matter rather than thumb power on a joystick. Here's another exciting selection to tax your mind

Adventures can sometimes seem rather daunting to the uninitiated. Apart from the necessity of learning abstract concepts and the all important mapping techniques, there's the bigger problem of word-based puzzles to solve. All this could easily turn even the average gamer. However we've decided to have a look at a couple of programs from Aristonsoft which may help to break you in gently so that you can conquer the adventure bug.



THE PHILOSOPHER'S STONE

Computerised mechanics aren't the exclusive preserve of Britainers and our US buddies. Europe is a hotbed of Commodore enthusiasts and Germany is perhaps the heart of the trend. It is fitting then that this game from Aristonsoft originally started life there. Actually called *Lepus Philosophorum*, but translated for non-Germans, this is an ideal starting point for new adventures and an interesting diversion for more experienced addicts, unfortunately only available for C64 and IBM disk users.

The basic storyline concerns a medieval king, High Constantine, whose sceptre has been apocalyptically possessed here. The only hope left to the old king is the Philosopher's Stone which has the formula, powers of turning base metals into gold and curing all ills to boot.

Your character is that of an ageing alchemist. You have found clues to the whereabouts of the Philosopher's Stone in a

book in some hole/where else? So you set out to get hold of it. Much more than you explore your house (more thoroughly fast). Leaving home may be a problem as the prince has discovered the secret of your quest and the pheromones released to detain you. However, with the right object you can bypass them and leaving you pass.

One distinct advantage for new starters are the HELP messages placed in strategic parts of the game. Read them well as these cryptic clues may prove invaluable.

More items which are available are included in the location descriptions. However, if you go to the market then it's more chaotic but you have to think hard about what you may need later on. Remember in SAVE your game position in the early stages so that you can go back for anything you may have wanted to collect.

The graphics are clear, colourful and reasonably detailed. Disk access is at the usual slow speed.

If you are moving between locations the format M/M/M/M/GOET/STICK can speed up progress. The programmer understands basic verbs/nouns for actions but on occasion a little more detail may be needed. One retrograde aspect is the necessity to enter all words in full with very few single letter names understood. Two that you can use are I for inventory and L for look to repeat a screen description.

There is no RAM SAVE facility but there are some control positions saved to disk. You will need these as in several places death will follow the wrong move, fortunately if you lose a game of Hangman with a trait!

Although a most enjoyable game with lots to find and plenty of puzzles to solve. There are similarities between different areas to complete the game to perhaps experienced players will appreciate that challenge. Definitely fun for all levels of player.

P.P.

NECRIS DOME

Due to limitations of space and resources, the Earth's dead are no longer buried or cremated as used to happen, but are transported into orbit. There, a huge space cemetery called the Necris Dome exists, owned - Run by a group of criminals, they in turn are controlled by an Anti-matter who is tasked to be trying to create something of a powerhouse for himself.

An wreckage had been buried on Earth for a few

uniform, it is really bad news when it is discovered that the Arch-magical has filled the Necro Dome with various potent forces and got straggled into the dome in the next batch of coffins. Your mission is to seek out and destroy the Arch-magical at all costs.

Necro Dome is a somewhat simplistic adventure which sends you to your coffin. The first dialogue screen you straight away. Although you can see nothing in the coffin either now or when you open it, if you return to the coffin and close the lid, a pair of rubber gloves has mysteriously materialised. Nothing is guaranteed to put off an adventure player (at least this reviewer) that such nonsense.



The atmosphere created by the game is minimal. Location descriptions are terse - "you are in the reception level chamber three as opposed to chamber two or four. The graphics likewise have a feeling of similarity to them. Even at a budget price, I cannot recommend Necro Dome G.H.H.

As promised in our HQ pages, we're not just trying to publish a run of the mill adventure column, so for those of you who want something a bit different, read onto check out some other original games.

TASS TIMES

If your idea of style is a red velvet dinner watch then you'll wish the fabulous graphic adventure from Acornware.

The game is set in the ultra fast (ironically) world of Tassotown that exists in another dimension. Your favourite old enemy, Gimmup has built an inter-dimensional machine and has got himself lost in Tassotown and it's up to you to find him. Helped by Gimmup's dog Spot who is really famous the Legend in Tassotown you must search this strange land (which isn't lost too much like a total tourist).

There's nothing weird about the excellent adventure system used to play this game. The screen displays a split into areas including a graphic display of your current location, a text display (for text only books) and alongside them a series of large icons through which you can quickly generate the commands look, enter, hit, buy, get, drop, talk to, tell me

about as well as north, south, east, west, up and down. You can also enter standard text commands and the predefined function keys to repeat commands and quit/save and load game positions. You can even examine and get objects displayed in the pictures by simply pointing a cursor at them!

The villain of Tassotown is an ugly green brute called Frankie Smoot who would love to get his claws on you as between his attempts to buy up the town. His intent is clear and other essential clues are packed into the latest edition of the Tassotown Times that also includes others that will help you become wiser and the usual collection of various useful ads.

Tass Times is undoubtedly a unique adventure featuring the most peculiar settings, characters and descriptions but it is also very good and will be Acornware's best non language adventure. Remember Tassotown welcomes visitors but not total tourists. **T.H.**



THE STANDING STONES

This is the second Acornware title which looks a challenge for the beginner without being too complicated. Set in the ground beneath an ancient stone circle the idea is to finish the long, lost Holy Grail.

When you begin play you must create a knight. Go carefully here, as a companion. A lot of attributes appear with random ranges of up to 10. If you don't like the numbers assigned, you can try again. The instructions suggest that you only accept a character with at least three attributes in double figures. In which case, why do they give so many with less than 10? The attributes are: vitality, intellect, boldness, agility, and mental force. These can be roughly translated as strength, magical attack, physical attack (such as 'leaf' and 'tear'), agility or self explanatory, and mental has indicates your ability to withstand attack.

Once you've settled your character, it's time to enter the 3D maze, where you must explore, fight monsters and collect treasure.

The maze must be mapped for you to maintain a sense of success. On the first level a series of arrows points the way to the exit. It is best to use that over and over again so that you build up your experience. Leave it at your peril.

Again from the monsters there are many useful items, including magical books, chests, potions, rings, weapons and armour. Unfortunately many of these articles are 'booby-trapped' so it's not all plain sailing.

When you encounter a monster you have several courses of action: fight, grab, knock or run away. Fighting is even the best option: however, often you cannot win and sometimes receive a warning and give you a gift as well.

Throughout your quest you have a companion named Lancelot. Most of the time he is sleeping or slithering his sword but occasionally he turns into action and dispatches your present foes.

The deeper you go the harder the game becomes. Further down there are items which will restore a ruined strength but they're not always in the same place.

The graphics consist of simple line drawings for the maze and fairly limited shapes for the enemies. You may lose the direction at any time to save your character.

Not a bad game if you choose your character carefully before losing the depth. Even then, you should not expect to stay alive long unless you map your route and this can be difficult due to secret doors and one-way passages. The *Bravard Maze* calls for a lot of patience as well as luck and a lot of luck.

P.P.



SHANGHAI

A variation of the word game puzzle does sound like the usual fodder for a computer game but it's surprisingly addictive.

This version uses the 144 played out in *Moby Joog* so the ancient Chinese game is arranged in a set pattern that is supposed to represent a dragon. The pattern runs in the middle to a length of the pieces of the head and down to eyes at single sites.

To complete your aim then you remove from the game the player can only match letters that aren't surrounded by others, which usually means from the head and tail. By the method you must try and remove all of the tiles or letters as many as possible either on your own or against a player or against other humans in a tournament game against the clock.

Matching pairs can be a strain on the eyes as you view into the screen at an average of 80 tiles that are at some 100 miles in the game. The others are hidden from view in the piles in the centre of the pattern which you must gradually whittle down.

Moby Joog also contains 144 tiles split into three major sets and each: horse and spots (also known as characters), bamboo and snakes (also known as dragons), and a set of wild cards (also known as wild cards). As there are four of each pair you would think that matching pairs would be easy but you'd be surprised at the number of times you'll have a choice between three pairs and have to work out which one to leave.

Options at the bottom of the screen allow you to undo moves you want to play again and even peek at hidden tiles and you've given us.

At last an add-on strategy game.

T.H.

DODGE GIZZERS

The big day has arrived. Your work, country of New Mystery is about to end. It was only supposed to be for two years, but you got too eager for bad behavior. You have been looking forward to this day for some three years now, and here because you have a small amount of estimated business to attend to. They were stretched up something rotten over that Long Dorian Spaghetti's paper and a spot of orange would not go amiss.

Dodge Gizzers is an adventure in two parts. In part one, you must find a crane to construct and assemble a team to help you do it. Part two involves pulling all the right crane. The game takes in the first kind of London, presumably because everybody knows that that is where all the real criminals hang out. There is the usual coffee, not of medicine you make your way round dark alleys, watching police, a doghouse and the dog track. Cranes are being constructed all round you, judging from the number of wasted papers about, but can you actually find the men required for your team? And who is the shadow, figure with the white crane shoes who runs up everywhere? And why are there several cranes hidden in the warehouse full of two such walls where they are clearly marked through the pattern? All you have to go out a telephone number from a colleague who was released on the case day in yep. All you want now is a working phone.

Dodge Gizzers is a reasonable enough game without being outstanding. The game is fairly crude, being for the most part workmanlike. There are a few good graphics, usually the wasted papers which brighten the place up but the jagged atmosphere and prices don't quite work.

G.B.H.

Toadfish

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Abstracts of the 1997 Annual Meeting of the American Psychological Association, 1997, Washington, DC, August 2-6. <http://www.apa.org/1997>

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¹ To be able to follow the discussion of the paper, it is recommended that the reader consults the following references: [1, 2].

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At some stages in the game leading can get desperate as players can lead each other particularly if a level five player is involved. Occasionally a manager gains the advantage if he leads on a 50% American square as he only has to pay half of his first bill.

Before each match the players must enter their total attack and defense strengths that are calculated from their selection card team. A few seconds later having contemplated these statistics each as home advantage and longer position the C64 displays the results just the game facing that the players receive.

The season consists of only nine matches as each team plays each other but also includes FA Cup competition featuring goal leaders such as Trevor Turner, and, from the second season (European matches, although your squad has to be good to live with the likes of Bayern Munich and Juventus).

Throughout the game your achievements and results are noted and are converted into game points and as the predetermined end-of-a number of seasons or a time limit the player with most game points will be "over the moon" as he has won the game.

One final piece of advice is keep off the Cross Square! This square space (named for "lack of a proper" square) costs you 500,000 and your best player!

A fascinating mix of computer strategy and board game for those who wish to form the football favourite. **7/10**

Touchline

Peter Brum Clough's Football Fortune Supplier CDS Software, CDS House, Buckle Road, Daresbury, Warrington, Cheshire, WA4 6AD. Machine: C64. Price: £14.95 (tape) £17.95 (disk). Dependency: 10/10. Playability: 10/10. Graphics: 9/10. Value: 10/10.

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1. **Introduction**

2. **Background**

3. **Methodology**

4. **Results**

5. **Conclusion**

6. **References**

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1. *Journal of the American Medical Association*, 1997; 277: 1039-1043.

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Penny, *author*

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The much appraised Ampco machine, only recently launched, is seen by Nigal as the future of Comrade both in the home and overseas markets.

Long Frank, Nigel commented that "probably the single biggest criticism aimed at the Amiga is that the business is unsure whether or not the machine is for the home or is a desk-top computer - a computer too highly priced to be accepted as a home computer and the lack of productivity

software and there is still a great demand for productivity software. The buyer who has grown up with a C64 or even a Spectrum, and is looking for a scaled purchase will appreciate better sound, graphics and top class games - Amiga technology lends itself to this market



Commodore 286S+ view

software makes it difficult to accept it as a business machine."

Commodore's answer to this criticism is to launch three different versions of the Amiga and attack both home and business markets in terms of price and quality.

Nigel explained that the first version, the Amiga 1000, has been the most loyal and it will be followed in the next few months by two new Amigas, the 500 and the 2800 to expand the product line.

Nigel explained the thinking behind this strategy. He envisaged that the C64/128 will be purchased as a family machine by first time buyers with a main use for children aged five to 12 years old. The machine is not too expensive but Commodore cannot be sure that the family will continue to use it. The answer to upgrading combined with continued brand loyalty is the Amiga 500 - the low cost version, described by the enthusiastic General Manager as "the ultimate home computer". On top of this the high standard for computer framing will

2800 Amiga

The 2800 Amiga will be a desk top or business computer and will also be the frame overlay machine. Nigel Shepherd believes that "the home is a fortress". Although traditionally used for learning and entertainment, many small businesses run from domestic locations as cottage industries. The 2800 will find itself both in the home office and true business application.

As we go to press, both the 500 and the 2800 are scheduled for launch at the Hannover Fair in Germany at the end of March.

Nigel also sees the Amiga gaining acceptance in tertiary education. He claims that it is needed for universities as its price combined with its sound and graphics capabilities are not found elsewhere. He quickly pointed out that the Apple Mac has neither the sound or colour of the Amiga and also claimed that neither the Mac or the Amiga has MS DOS capability.

Purely for Business

Commodore's third version of interest in the computer market is the moment is inextricably the business and due to the Amiga's PC AT, XT and MS DOS compatibility. Commodore has also launched the PC 10 and 20. The PC 10 was only recently launched in the UK as it's still under development for these machines.

Waxing Philosophical

Nigel Shepherd explained the Commodore philosophy in the following terms. "Commodore will continue to design and manufacture machines that are competitive and will enable both Commodore and vendors to make money. We will continue to be in the MS DOS market place. There will always be a home market and Commodore's original forte is serving that market. Commodore is moving up market to desk top publishing and desktop type machines. We are committed to today's and to future market places."

He added "The difference between today and two years ago is that now a machine can be suitable for all of the markets - home, personal and business - all in one box whereas before there were three distinct machines. Commodore has one major advantage - the Amiga chip set."

Asked specifically about Commodore's UK profits, Nigel replied "Commodore Nearly American has been through rough times in the last 18 months and like Commodore UK, had to restructure the business and start all over again." However, Nigel believes that the corner has now been turned. He sees Commodore UK consolidating and building in the country. Absence of major promotion was evident in the past but the company has fought for survival and we will now see a much more aggressive approach. Nigel Shepherd is confident that Commodore will return to being a major force in the UK marketplace.

For Commodore certainly hopes so and would like to thank Nigel Shepherd for taking time to express his view of Commodore North America.

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Sport on Channel 64

*Futuristic sports games are all the rage at the moment
Try your hand at these out-of-the-world titles*

By Tony Hetherington

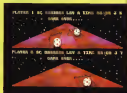
Sport in the future (stretching to the softest future) is to be fast, furious and will usually involve a sizeable 'ball'. There obviously won't be any grass left in the world as not a blade is in sight, as an average of 1.3 humans live on every square micron, and generally in purpose-built arenas, planets and worlds.

Futuristic sports games are veritably influenced by science-fiction films, notably *RoboCop* and *Death Race 2000*, and are often developed from existing sports to become flying saucer versions.



Racing Destruction

Bizarre's *Alien Arena* levels off the future racetrack as you compete in a battle of challenges known as the Alien Arena. Written by Uniden author, Andrew Brinkwood, the race must compete in contests such as the Mad Open, Astro Chase, Glazed Open and Mad-Mix Smash. He plays a custom-built convertible racer that can ramp from high speed, electric single racer mode to a slower two-lane mode for maximum destructive power. The races are run over a variety of planet surfaces that range from the highly



chartertrack and the fully Alien to the indestructible hardball which will destroy a racer on impact.

The object of the game is to win points by winning races and prize money so that you can enter more races in your team. Points are won by completing the race (a achievement in itself), by shooting the least firing, using guards that are thrown at to keep things up and by



requiring bonus points that depend on the race type. As time trials bonus points are linked to your time at conference events it's surprising that custom and in destination races like mara do not display the leaderboard.

Age Group	Percentage of Respondents
18-29	~75%
30-49	~65%
50-69	~60%
70+	~60%

Golden ThreadMaze is, by comparison, a far simpler game in which you must bounce a ball down a track that narrows out of the screen at you at breakneck speed. Again staying on the track is a major task as you'll without your opponent's ability to push you off into oblivion. Rebounding from square to square you must plan your route along the curving patterns avoiding the traps that slow you down, reverse you clockwise or send you plummeting out of the screen. This isn't ready to gootty push your opponent over the line in your three crucial seconds to win the race.

Reflexes (Activities) are two Rotalsols in competition with each other as they race around a bevelled patchworking (wood) ball. Their aim is to flip the ball into one of two wooden goals.

In a soccer game, the balls that are controlled by either human or dried goats can kick or lift the ball using their powerful forefields. The neurons immediately permit with a good living worth more if it is moved from a distance. A fair and honest game that's essentially addiction to play.

The same would also be said of Eldon's *Myosotis* which means the battle for the Super Cup between two teams from the Hawks and the Vipers. Before the match you can choose your gloves. From the 10 you are asked to be your preferred work one and two and handball gloves. After a quick appearance by the other leaders the players (after three previous minutes) of the neutral pole in which the goal plate travels on its rollers, gets up and down making goals even harder to see.



Thanks to a honey-bell network the player is dropped in areas in between which can hold bonuses and rewards, and captured by a player. However he has only two seconds otherwise he considers a penalty) to pass the ball or shoot at goal.

After 10 grueling minutes of play the result is reported on the stadium scoreboard for Fubo.

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Answer: Yes, an individual's name off from CPL's Tax Cuts and

Found in the Cal-croga linear complex. Described as a structure of Ballflower and Pong the game features a split screen battle two giant bats to knock a ball behind them, equivalent to soccer goals.

Kneecrunch is a ball used in a goal in the aim of August Free Software's *Knee* and is a futuristic development of above halfpenny football. The two contestants must first throw some craft to sentence at a set knock the ball into the goal to score in front of a concrete crowd.

Finally, the *Initiate Josses* from *Beyond Silver* description as two armour clad knights, called *Fire* and *Ashley* (in a small bell-shaped office and entrenchment in the road to great empty, ancient, woods).

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Address: 505 Wilson Road, Essex, Essex, Essex, Essex

[illegible]

Articles: J. Pineda-Lucio, Heterogeneous London APT/APN In
60-61, 1984



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programs use this approach to provide BASIC instructions without reducing the memory available to the user programs. The Listing 1 provides a general routine which will store and recall blocks of up to 255 bytes on disk. To those of you who aren't on the fence, the disk is split into 32 tracks, each comprising of a number of sectors. The number of sectors varies from 17 to 31 depending on the position of the track. Each sector holds on block or 255 bytes.

The program uses a menu system to provide five options. The first option reserves the specified sectors and fills each with a zero byte (00). This is because a zero byte is used as a sentinel to indicate the end of a string. The instructions for allocation

operation is validated if you use the various instructions to format.

Option 2 saves a string of the required locations. Since you can want to input string of up to 255 bytes, a special input routine from 150 to 160 is used. All you do is type in the string using cursor keys and DEL to add it. The string read in with an asterisk. When the string is complete, press back arrow to position it. The sectors on the disk are numbered sequentially so that track one holds sectors 10 to 20, track two holds sectors 21 to 41 and 32 sectors are of variable length the sector from track 1430 to 1439 is needed to calculate the relevant track/sector from the number of the disk block.

Option 3 loads and prints a

specified disk block. If you want to enter data in your own programs, you should reproduce lines 100 to 109 from 1430 to 1439. If you're a casual programmer, you should also use the drive checking routine from 1070 to 1080.

Option 4 prints a map of the disk contents. Allocated but unused sectors are shown as "0". These containing data blocks are shown as "1". The final option simply allows you to format a disk.

Data saved using this program does not appear on the directory sector of a written sector to the disk. If, in fact, you use the track which holds the start of the directory (track 18), and try to load the directory, you will get an interesting result! 70

PROGRAM LISTING 1

```

10 GO SYSTEM
20 PRINT "DISK CLEAR AND AC"
30 PRINT "TYPED VARIABLE"
40 GO SYSTEM CLR PRINTING ROM H
50 "YES" THEN PRINT
60 PRINT "DISK SET UP OF 32"
70 PRINT "SECTORS"
80 GO "PROTECTED ADDRESS" 1-1
90 PRINT "DISK AS" 1-2
100 PRINT "DISK AS" 1-2
110 PRINT "DISK"
120 PRINT "DISK CLEAR AND AC"
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PROGRAM LISTING 2

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10 GO SYSTEM
20 PRINT "DISK CLEAR AND AC"
30 PRINT "TYPED VARIABLE"
40 GO SYSTEM CLR PRINTING ROM H
50 "YES" THEN PRINT
60 PRINT "DISK SET UP OF 32"
70 PRINT "SECTORS"
80 GO "PROTECTED ADDRESS" 1-1
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expedient of using characters as the villain's tools to remove an offending part of mind or body. That is how produced thousands of usually mild-mannered who were sent to patrol the law-abiding sections of the city and who had instructions to kill on sight any emerging prisoner. But as you might imagine by the simple method of blowing their brains out, but in their few limited hand-cumbers which at least afforded the prisoner a lightning chance. But who can I argue as without such far-fetched plots as these, computer games would be so much the poorer?

As it happens, one such prisoner was trying to escape (I bet that sounded good). You play the part of Duke as this alien heat-on-up from Mainframe House. In order to gain your freedom, you must travel through six rooms of the city, being or avoiding the obstacles as you see fit. The main obstacle the evil block guard who prison will cut down town and the outer wall. Available actions are run left and right, jump and stop, punch and kick. There are five different types of obstacles to overcome as well as potentially, metal traps, hidden behind doors and oil barrels. All this must be done against the clock as you engaged to outpace the golden computer causing the outer city to self-destruct. As a hint as to how much time you have, you can see an indicator that Rose Hubbard's usual track lists for 17 minutes.

And that's all there is to it. The graphics are okay, the music is dreadful. Save your money. **GLEH**

Touchline

*File: Amiga/Intuition: Machine: C64 Supplier: Electronic Dreams
Price: £8 (High Street) Hampshire: W&L, Southampton: Spin-Phaser, Surrey: STI 4/18
Dependency: VMS Graphics: VMS Physiology: VMS Files: VMS*

DANGER

Try this story line for size. One or two players working as a team rush like mad through 15 dungeons, knocking the stuffing out of as many nasty, evil monsters as possible and passing only to pick up treasure, keys and the odd hint to keep their strength up. Sound somewhat familiar? Yes, it's *Danger*—hopelessly a Canadian clone from Electronic Dreams.

The two characters are Thor and Sheba, two not very nice characters, all brains and no brawn. They are utilitarian, a considerable amount of damage before even they succumb to the forces of evil. Unfortunately, the two hundred or so enemies are not as cutting edge as others in this arena. What is worse, there's a constant of dark rooms to cause an endless supply thanks to the fact that there are monster positions scattered liberally around each dungeon. If you can destroy every creature in a particular arena, you can also destroy the generators so that they plague you no longer.

Sound is only one of the vast goodies for pick-up as you travel, restoring or adding your little weary body. Keys are just as important, as they are required to allow you access to other parts of the dungeons. However, as they can be destroyed by shooting them and if you are not careful on the clock of time, you may well find yourself out of it! Everything is forced and there is the random effect of killing, deconstructing or



perforating the enemies. I repeat, however, it is a little strange from being something to make your journey worthwhile, it is an extremely random trade your minutes for things. The few teleports to be used and disappears at a set of cheap prices you a that is solving a middle.

All the backgrounds are bright and colorful and the set plenty of features crowding round the things in a price game but the overall effect is to make the game look very messy. Compared to the graphics, where the enemies are a bit simpler but look a bit better for it. Not a bad game to master that certain spirit that makes it a great one. **GLEH**

Touchline

*File: Amiga: Machine: C64 Supplier: Electronic Dreams
Price: £8 (High Street) Hampshire: W&L, Southampton: Spin-Phaser, Surrey: STI 4/18
Dependency: VMS Graphics: VMS Physiology: VMS Files: VMS*

RED MAN

All you have to do to complete the game and save the Asteroid is to discover 27 hidden mines on the surface, find the left and then on right, but up make sure you're looking at the engineering area, that does a few power plants and finally regenerate any crew members in the laboratory computer. This shouldn't be a problem as you're riding Red Man!

The Asteroid is one of a group of two planets, red was not to escape the Sun and began to disintegrate before Nova came. Sadly just the Sun the mission went back wrong when members of the Rembrandt Deeds team died and abandoned the power plants. The alarms sounded and now you must ride Red Man to the rescue.

The game plays like a sequel to Mastertronic's The Last V8 as you drive your bike around the planet's surface in the top half of the screen while maintaining controls in the bottom half.

The planet surface is packed with traps to hinder and destroy your efforts. These include lava flows and green biological slime as well as the buildings that destroy you if



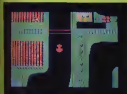
control. My favourite screens are in the underground tunnels in which you must drive through lakes and rivers that try to drag you along with the current.

Red Wax is yet another highly addictive budget game that drives you back for another game, upon and upon.

T.H.

Touchline

Title: *Red Wax* **Supplier:** *Codemasters* **Developer:** *Business Centre* **Developer:** *Clive Barber* **Game:** *CM38 787* **Machine:** *CM4* **Price:** £1.99
Graphics: 5/10 **Graphics:** 5/10 **Playability:** 5/10 **Value:** 5/10



STREET MACHINE

You are back driving a top-down game. You are a high-powered motorist that just ain't never a snail, although you would not think it is in look at the screen which depicts an overhead view of you and the other street cars as you drive round a winding track. The cars look like souped-down Datsuns.

You race it split into three sections - normal conditions, uphill and on. Control is straightforward. Accelerate, decelerate, left, right and brake. The usual objective is to get

round the course as fast as you can but there is no indication of how well you were doing before you wrote off your vehicle. Even a simple 'You have travelled X miles' on a high score table would help considerably.

Major crashes result in your car exploding and game over time. Major bumps and general wear and tear can be fixed although it costs you time. A two-page status is presented showing all the various bits of your car and the amount of damage that they have accrued. Anything that is more than 40% damaged must be fixed. This involves moving the cursor to the right a lot and waiting. Damages repaired with time and you are limited as to how much time you have available. This part of the game is dull as the average - it is just a case of looking down the list for high numbers. The same of the part is irrelevant.

This game is neither original nor addictive. It would have been reasonable if it had come out in 1981 but now it looks very dated. In the computer game *Grand Prix*, *Street Machine* barely makes it over the starting line.

G.H.H.

Touchline

Title: *Street Machine* **Supplier:** *Spectrum* **Developer:** *Proton* **Price:** £7.99 **Graphics:** 2/10 **Graphics:** 5/10 **Playability:** 1/10 **Value:** 1/10



BLOOD AND GUTS

Dreadful barbarian style 19th-century action from Swedish authors, based American Action. The game that promises all of the violence and brutality you've ever dreamed about fantasising 18 violent minutes in which the lower identity loses his head (thanks to a handy on position position).

You can win when your ability from the mother collection of *Knave*, *Maid*, *Nop* and *Doc* showdown but is a giant rather a human or computer opponent or challenge where the success of a punch-wrapping is crucial to victory.

The contestants are listed in the full by name that contains their strength, accuracy and constitution (a list of a entirely violent crowd).

During the contest they compete in a tug-of-war where the lower ends up on over, the lower jump where a second of leaper must land on his head and the point light over a move

when the boat takes a dive?

A bar fight in stocks from the live to open for the human but event in which the player must beat back an invincible army and dog. In the end throwing the barbarians get a chance to throw you a) each other and in the end throwing a poor wussy barbs through the air and heads dangerously close to a hanger looking crowd.

My favorite event is the beer drinking in which our hero must quell three barrels of beer without spilling a single drop. A mixture of timing and wiggling are required to keep the barrel and deliver the warty batch before your opponents cleared the drink. Finally three rounds of beer wrestling and the contest with a single delirious first blow to the loss.

Each event is supported with "fun" graphics such as a cross section of a bar fight, head so that you can control the flow in the beer drinking and events of the players during the mountain walk to recover any loss of balance.

Overall the game is good fun to play despite its tiny appearance and makes a welcome change from the slopes, fields and tracks of the more serious sports simulations.

T-10

Touchdown

*Title: Blind in Love: Supplies, American Action, Inc. (1989), 880 41 Melrose, Los Angeles, CA
Objectivity: 3/10 Graphics: 3/10 Playability: 3/10 Value: 3/10*

HYPY-BALL

It's the day of the Cyber Super Cup and a mass, clash between the Hawks and Vipers. You captain the Hawks in the ultimate cage game in the Universe - Hypy Ball.

Before the match can begin you must choose your team from the pool of 18 players knowing that the computerized reports are just a ruse to keep up the steam. You can judge a player's abilities from his strength, speed and agility ratings as you scroll along the lists of Alex Green, Fredo Flango and Stu Gershewitz.

After a few minutes of games you're disappointed in the 18 minutes of matches you'll begin to get which are the best.



players as the computer will park them near. However as you get first pick you should soon be in with a chance.

The Hypy-Ball strategy is split into two halves by a central pole along which the goal ball is slowly only moves up and down in a constant rate. At the other edge of the arena the pitch is bounded by a force field that teleports the steel playing ball into the other half.

After a quick tour from the show leaders the players take their position. The strike cones and two heavy cylinders side of the pole will not restrain to that half of the field, whereas the goalkeeper can move where he wants so long as he keeps his feet on the ground. The match begins as the ball is fired into play.

Control is split into one strike and the goalkeeper in turn one team. The strike while target and follow once you'll be shooting ball. Once you catch it you have to think quickly as you only get 2.5 seconds to get rid of it or forever you'll receive a penalty and a certain goal.

Goal is achieved by firing the ball at the goal but since it's a moving target this isn't easy. In a 10 minute match against a good computer opponent your team's score must be total as the highest laps will be best to score.

A fast and furious futuristic sports game supported by superb sounds and speedy gameplay.

T-10

Touchdown

*Title: Hypy-Ball: Supplies, GTE, 74 New Oxford Street, London WC1A 1PS, Machine City
Objectivity: 3/10 Graphics: 3/10 Playability: 3/10 Value: 3/10*

ROBOT RASCALS

Robot Rascals is the latest game to be released by Activision Arts (through Amstrad) and is a game that's half computer game and half card game!

Basically, the game is a multi-player treasure hunt with a load of cards showing what the players are looking for. Four cards are dealt in the program as loaded in. Then the players select one of the 18 robots that would suit for at home in Activision Arts' classic game M.U.L.E. Although they are vastly different, there doesn't seem to be any difference in their strengths or abilities.

Each turn, each player gets to move his robot around the alien world of Laxxonol using one of three selected attributes. Moving through rocks or trees costs more energy than strolling through the plains. Better way this energy is deducted from the robot's turn allocation. When all the energy has gone the turn is over. As well as moving a robot can scan for one of the Minerals that exist from a scan disk to a digital disk. The robot then spins around (to be quick in the spin the closer you are to the object) and finally points the direction you want to go in. Collect all four objects and return home to the center of Laxxonol and you've won the game.

Unfortunately, it isn't that simple in the other players are out to stop you. There's another pack of cards, the task cards, that tell them you to show your hand to the others, allow you to swap one of your cards for somebody else's or get someone to swap with the disruptive "pass the truth



and "All this whirling and drizzling is necessary as your cards (and the objects they represent) are better than others such as the Super Shield and Velocity Vortexes that add to your robot's powers whereas the Energy Eater and Active Aether slow you down. That'll even a killer card that stops you from winning while you can pass it on to someone else. The card you passed around a lot.

The match doesn't end with cards as you can also get your robot to go out and slug the other players by mashing them and the working what you want but you can also use energy to build shields to protect yourself from slugging.

Finally just as you thought you had things under control the game adds one of its global factors such as slowing down all movement or increasing the energy and weapons your plans.

A fun game for all the family that is best played with the maximum four players to allow maximum sociability. There are two card decks as people have been known to drop them that I've wanted at the bottom of mine just to punish my victory celebrations but don't worry I'll get revenge.

3.66

Touchdown

Title: *Touchdown* **Author:** *Supplies: Electronics Arts (Stratford), 65 Long Ave, London WC2E 9ST* **Machine:** C64 disk **Price:** £14.95

Originality: 5/10 **Graphics:** 7/10 **Playability:** 8/10 **Value:** 5/10

LIGHT FORCE

Plating a lone Light Force fighter craft, here is yet another science group you, the chance to put the wrongs of the Universe to right. This time, the object of your mission is simple as you attempt to wipe out an alien force that has moved a three-sided red prism on the edge of the galaxy. You later find a another alien ship.

What is it that whenever there is any sort of trouble, you are the only person around capable of sorting it out? That was the "lovable" cutesy in the form of a few thousand alien

ships and grooved defences spread over each divergent landscape as jungles, unusual belts and icy planets.

Despite the one-trial storyline, *Lightforce* plays very well indeed. The graphics, while not quite as stunning as the *Hyperzone* version, are still noticeably. The game itself is basically one of learning the patterns of the airborne aliens while at the same time, manoeuvring yourself into a position whereby you can blast the ground targets. That task is made more tricky as there need several hits to destroy them. They are vital though. Take out four control centres and you have yourself a most welcome victory. Apart from your two lasers, there are other special weapons to be found and activated as you continue your aerial journey on.

Faster Than Light, the company producing *Lightforce* has managed the aim to produce that makes shoot em-ups stand out from the crowd. The game is a noticeable addition. Couple that with the on screen effects and *Lightforce* becomes an essential purchase for anyone who enjoys a fast pace.

G R H

Another

Title: *Lightforce* **Supplier:** *Faster Than Light* **Supplier:** *Johns* **Price:** *Hyperzone* £14.95 **Machine:** C64 disk **Price:** £14.95 **Originality:** 7/10 **Graphics:** 8/10 **Playability:** 8/10 **Value:** 5/10



Xenos

Developed from a game played by planetarium visitors, back in the 19th century. *Xenos* was originally a game with few rules and considerable violence. The basic idea was a fairly substantial one - try to hit a pack into your opponent's goal more times than he managed to do the same to you. If the pack of you happened to hit the opponent, tough luck!

In today's sanitised version, the game has become a huge spectacle sport, the rules have been added up somewhat and chaos has become a highly controlled. Xeno is your chance to become one of the sporting heroes of the galaxy.

The game is a sort of space age ice hockey. Each player controls a disk and takes it in turn to fire a signature on the homop-shaped puck, the ultimate objective being to knock the puck into your opponent's goal. You can try and hit the



push directly, knock your opponent's disk out of the way or try to block his shot. The game is played over four quarters and the person with the highest score is the winner.

Playing *Kickin'* is simplistic itself - you simply move a small arrow around the pitch, pass the ball and wear this trophy in the appropriate direction. The game can effectively become very tedious as there are a number of variables that you can fiddle with: one or two players, the length of each quarter, the amount of time between shots and a hand-capping system for the computer. In practice, the delicate values work as well as any others and lead to a fast and furious game although not one in which you will be beaten out of sight by the computer.

Kickin' is well implemented, simple game that is great fun to play.

G.B.H.

Touchline

Title: *Kickin'* **Supplier:** A & P. **Victory House** **Licensee:** *Flare* **London:** W/C20 1NB. **Tel:** 01 419-8668 **Machine:** C64 **Price:** £1.95 **Compatibility:** 6/10 **Graphics:** 6/10 **Playability:** 9/10 **Value:** 6/10

while over estimating can result in legs pulling balls and kicking from your chairman.

Except for cup matches, watching games is optional and if your side is having a particularly poor spell then you may wish to watch another game from another division. The commentators are rather lengthy and take about 15 minutes of all that commentary of the game helps identify the quality of your players.

After each game you are given the scores, scorers and attendance figures for all matches. The attendance figures and playing records were selected from the 1985-86 season and add a very up to date dimension to the game.

Overall 'The Double' is an exceptionally realistic game and an absolute must for any football fan but it is at times rather slow and time consuming.

S.K.

Touchline

Name: *The Double* **Price:** £19.95 **Machine:** C64 **Supplier:** *Johnson* **Licensee:** *Johnson* **London:** E16 7JH. **Tel:** 0834 230445/417738 **Compatibility:** 6/10 **Graphics:** 9/10 **Playability:** 6/10 **Value:** 9/10



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THE DOUBLE

Every football manager's dream is to achieve the 'double', by winning both the league and FA Cup in one season. This achievement has only been done five times in the history of English football but here you can try and make it six with this new football simulation game from Johnson.

Being a football nut myself I can honestly say that this is by far the most realistic game of its kind I have come across. All the usual gameplay features are included with the type of game, but this particular one has many better features than its rivals.

Included among the options are ones that allow you to employ scouts to report on any team or player from any division and a physiotherapist to help nurse your injured players. As well as coping with the human problems you are asked to deal with the element of ground improvements, bookings, wages and even organising your attendance. Underestimating the crowd can result in serious battles

CHAMELEON

In what *Illustrated* describes as a "survival" science adventure, you are Chameleón. Made from Man and Flare the fabric of magic, you must save the four rulers of Fire, Earth, Air and Water and its battle with the demons that now rule them. These demons were created by a cruel man to misuse the powers of nature and so wreak havoc on the Earth with dark storms, blizzards and dust storms.

Using your fire you can smother the demons and defeat them in combat while repairing the damage caused by the twisted flux.

During your quest you must journey through three strange realms and seek out the twisted flux that can be found only in a certain place and a specific time of day. Luckily, you are fitted with warning beacons that sound when you meet one of the crystals, then it's mostly a matter of fighting off the demons long enough until you can progress to the next realm.

The game features a familiar single 3D display as found in *Crashin' the Way* or the *Chameleón* issue's past or assortment of energy draining pools and holes and



background details, pyramids, trees and mountains. Oncoming attacks from the desiccated flames, molten, molten and disintegrating stone your flux energy before which can be replenished by collecting the sparkles that are left if you blast the Super Demons.

Underneath that surreal coat of realism, *Flux and Limbo* has a surprisingly neat, shallow and ordinary arcade adventure. **EM**

Teacher

Title: *Chameleon Supplies, Electronic Systems, 31 Carlow Drive, Southampton SO4 2BW Tel: 0703 230004*
Maker: C&H
Originality: 5/10 **Graphics:** 5/10 **Playability:** 5/10 **Value:** 5/10

HEARTLAND

The strangest thing can happen when you read a book that was found in the attic. One day was all about an overgrown wizard that saved a magic land from the evil forces of the Warlock Males. As you turn the end of the book you realise that the last 50 pages are missing! Then to your horror you find yourself in the land you were reading about and down to the wizard's castle which is armed only with a self-repeating trap bar.

Your mission is to search the strange platforms and paths of the Heartland for the missing pages so that the overgrown wizard can happily retire. However Males know of your presence and has sent his minions to get you. These consist of the opening wounds and the indestructible golems that chase you even after you've blasted them into a pile of bones.

Your mission is further hampered by the ever-changing terrain and battles that float above the platforms and warlock pages that demand a different code to the book involving lots of C&H for you and the Heartland.

Help is at hand in the most powerful weapon that you can find such as swords and fireballs as well as other items that give you temporary immunity and a tool that transports you from one scene to another. Despite the threat of Males on the way and gets even closer every time one of

his minions or spells touch you until his face appears at the top of the screen ending your game.

Heartland is an excellent arcade adventure featuring some exceptional graphics particularly of the crumbling mountains as they change into a pile of bones. **TH**

Teacher

Title: *Heartland Supplies, C&H First Floor, 31 New Oxford Street, London WC1A 1PS*
Maker: C&H
Originality: 5/10 **Graphics:** 5/10 **Playability:** 5/10 **Value:** 5/10



SKY RUNNER

By the 21st Century man was spread throughout the galaxy and at last the governments had found a drug to control him.

There was the crash of years of research and countless failures as previous drugs had lost given people in a hopeless daze. Then one simple plant called *Nikotamin* they actually found it growing on trees. Seventy per cent of the plants were lost from consuming the drug. Six.

Flora of Six Runners riding their Six Bikes were dispatched to harvest the drug produced by the last living trees that were built to protect them.

Although necessary (normal poisoning methods didn't work) control drugs were still illegal. You are part of the Runner Squad that was formed to sabotage the Sky running on the forbidden world.

As you're paid by results you set off to land in many levels if possible. The game begins as your spaceship lands on the planet.

Your first problem is to take out the last seven that protect the Sky following bikers. With your single shooter you must cut you the seven by blasting them at high speed attack runs. Only then can you land and drop your first of three bikes.

Charging through the trees (that are as deadly as the towers if you crash into them) you must track down and

desires the Sky Riders has you must take care not to destroy your fellow racers' speed cars.

Unfortunately, even the eight different classes of skill levels do nothing to save a game that is bland and reminiscent of a four-year-old Spectrum game! **T.H.**

Touchline

Title: Sky Riders **Supplier:** Cascade Games **Hardware:** IBM/MSX **Machine:** C64

Originality: 4/10 **Graphics:** 6/10 **Playability:** 3/10 **Value:** 5/10



STARGLIDER

Simply put, the game that features vector graphics as good as any, except in a box with a 64-page novel, postcard and key guide and was every possible accolade in its previous version, is at last available on the C64.

The Star Glider is a question isn't this what they fly by pointing it at on screen controls but planet lands that lead to the downfall of the planet Norvina. These lands suggested through space to Norvina and were fired by the planet's Scound "zap anything" defence system with an attack of



concentration, reprogrammed, the Scound. Unfortunately, they also let us the Star Glider shaped Ego's tank that the destroyed the defenceless planet. Luckily, you were on a nearby moon and have found an ancient software program, a tank vehicle (AGAT) and have gone to the rescue.

There's no goal whatsoever to be fulfilled as you just simply to destroy all you can before they finally get you. You find you can use the planet's relief, water and repair facilities that should improve your chances.

Using a combination of keyboard and joystick controls, you must fly your AGAT and do battle with a collection of alien craft that include the Star Wars inspired walkers and starships, tanks, arrows, missile launchers and the flapping Star Gliders. Most take more than one shot to kill and some such as the starship can only be destroyed by firing a missile that you must guide to the target through a separate display.

An excellent game that has been ruined by poor programming. **T.H.**

Touchline

Title: Star Glider **Supplier:** Rainbow **1st Floor:** 74 New Oxford Street London WC1A 1PS **Machine:** C64 **Price:** £14.95

Originality: 5/10 **Graphics:** 3/10 **Playability:** 4/10 **Value:** 6/10

10th FRAME

Ten pin bowling is the name of the game in this latest sports simulation from the Amiga/PS Gold stable. 10th Frame allows up to eight players to have a go at knocking over ten skittles as possible on either a league or one off basis.

For the moment, you pin bowling involves rolling a huge ball down an alley as you attempt to knock over 10 skittles. You get two attempts to do this. If you succeed in knocking them all down with only one ball, this is known as a strike. Taking two balls and a becomes a spare. The target of a high score is to make sure of getting nine spares.

In order to launch a ball, you must first select an bowling point and position your arm on the line. Keeping the ball back pressed will start a bar moving up a scale as you determine the speed of your release. Two small markers determine the side upper and lower limits for an accurate throw. The bar then slides quickly down the right hand side of the scale and you must press again to stop on one of the three markers - straight, slight back and maximum back. When your press and your ball is likely to make an early roll into the second gutter.

Graphically, the game is a little disappointing. The effect of the skittles falling down is well done but the line is weak - one fifth the width of the screen. The worst part is the sliding scale. Yellow on orange proved very hard to see, especially under artificial light.

10th Frame is a highly accurate simulation of 10 pin bowling but lacks a little in addictive qualities. **G.H.**

Title: 10th Frame **Supplier:** US Gold **Units:** 2/1 **Refined:** Way Refined Birmingham B6 1AL **Machine:** C64 **Price:** £9.95 **Originality:** 6/10 **Graphics:** 6/10 **Playability:** 7/10 **Value:** 3/10

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Cribbage

If you've ever played cribbage then you'll know just what an addictive game it is and if you haven't then try our Plus/4 version of the game

By Hugh McGhee

Crib is one of the most popular pub and games in this country, but have you ever considered trying to beat your computer instead of beating against the champion down at your local? Now's your chance, if you've got a Plus/4.

Instructions

It is assumed that the player knows how to play cribbage. The rules are exactly those given in *Hoyle's Rules of Games*. Since some aspects of scoring points vary from region to region, the points scored in this version will be specified in this introduction. The following points should thus be noted:

- 1) Due to the layout of the CribbX is used to represent a 10.
- 2) Input is handled by means of a joystick or pen (see). When asked to play or draw a card, simply move the marker which appears above the cards to the required position and press the fire button. When entering your points moving the joystick < left > and < right > will < left > decrease and < right > increase the points currently displayed. Once again pressing the return key accepts your response. The program is protected against attempts to draw or play the same card twice. Attempts to draw too many points produce an error message. The Plus/4 always claims the correct number of points for each hand (I've not played your points, the Plus/4 will warn them).
- 3) Each player is dealt 10 cards and must discard two cards into the crib. The Plus/4 plays a simple strategy, showing its best four cards after consideration of the two cards it is discarding. The cards are shuffled after every hand but only cards are shuffled out of the pack to save time. The program differentiates between dealer and non-dealer. The player who does not have the crib always receives the first card.
- 4) The Plus/4 sets the cards for the initial crib. The lowest card wins. Note that in this game the two chosen cards are not allowed to two cards of spades, for example, will not be displayed. They however such as both players making a pair of different suits are permitted, in which case the suit will be performed again.
- 5) The first player to obtain 122 points or more wins.
- 6) Note that in the run up the Plus/4 will check your cards if you are too late to go. This is the only time the Plus/4 examines your cards but it does not cheat. Any displays of an ability to play after entering "can't go" will produce an error message as well as attempts to play a card that would result in a total score of 31. The Plus/4 does not play a strategy in the run up except that it will always make the total 31 if it can. It will not, however, where make the total 33 even if it can.
- 7) The ending of a game the run up has proved the most tricky operation in practice. If the player plays last the Plus/4 does not know that the player cannot go unless the total is 31 as the last card has been played. Otherwise the player must enter "can't go" before entering the last point.

Points are scored as follows:

- A) Two points for any pairs, six points for three cards of a kind and 12 points for four cards of a kind.
- B) Two points for any combination of cards totalling 15, including proboscis cards as 10.
- C) For any run of three or more cards, count one point for each card in the run.
- D) For obtaining a total of 19 or 31 in the run up, score two points.
- E) For placing the last card in any go in the run up, score one point.
- F) For a flush of four cards in your hand, score four points. Note there are no points for a flush in losing the crib.
- G) For a flush of five, either in your hand or in the crib, score five points.
- H) In the starter card is a trick, and it is your crib, add two points when counting your hand in the next game.
- I) If you have a jack either in your hand or in the crib of the same suit as the starter card, count one point.
- J) The game is played on the high standard screen to display the different background colours.

Variables

The array CribbX(4) has four rows and

14 columns. Columns one to 13 hold the dimensions of the cards from one through to king. The area element of each row holds the suit for that row. The suits are, in order: spades, hearts, clubs and diamonds.

The 13 cards shuffled out of the pack for each hand are placed in the $SHUFF(a)$ array. This has two rows of 13 columns, now also holding the dimensions of the cards and row one four respective suits.

The array $CH(a)$ has four rows and one column. This holds the suited or suited dealt to each player. The $FL(a)$'s dimensions and suits are at rows one and one respectively, the dimensions and suits of the player's cards are at rows two and three respectively.

The array $FL(a)$ is used after the dealt has taken place. It has four rows of the columns and is the major card area used in the game. The first four elements in rows one, two and four hold the dimensions of the four cards in the $FL(a)$'s hand, player's hand and the crib respectively. The associated suits are stored in the first four elements in rows one, three and five. At the commencement of the main game the fifth element of each relevant row will be occupied by the dimensions and suit of the starter card, which is used by all hands.

The four values for the deck of cards are stored in the array $PD(a)$, one into holding the values one (for

The major under variables are as follows:

- MP**— Player's points
TP— Player's points
UP— Used in run ups to store number of cards played in the current go.
Used in total the points in the points count routine. Also used in the run up to hold the total face values in the current go.
FD— Used in the main game to hold the total points scored during the run of T above and the result of checks for flushes, jacks etc. Also used to hold points scored in the run up as T is otherwise engaged.
ML— Flag used to indicate who played the current card in the run up. It is 1, if not then the $FL(a)$ played last, and if 0, if not then the player did.
IC— Flag used in the run up to indicate whether or not the $FL(a)$ can play a card. The $FL(a)$ is able to play a card whilst IC is equal to one and unable to go if equal to zero.
WC— Scores the same purpose as IC for the player.
MO, YO— These two variables hold the number of cards played in the run up by the $FL(a)$ and the player respectively.
WC— Signifies who holds the crib. If set to one then the $FL(a)$ has the crib and if set to two the player has the crib.

the ace) to 13 (for the king), whereas row one holds the values one to 10 (as the purpose of counting 15).

The respective values of the shuffled cards are placed in the array $SHUFF(a)$ after shuffling. The values are transferred to $CH(a)$ after dealing the cards and are finally stored in the $FL(a)$ array after the dealt. The arrays $SHUFF(a)$ and $FL(a)$ have exactly the same format as the $PD(a)$ and $FL(a)$ arrays discussed above.

The array $PD(a)$ is used by the scoring routine for run checks. The

scored cards are placed in row one and after transfer by the scoring routine into row zero. This row is sorted into ascending order.

The arrays $MP(a)$ and $TP(a)$ are two vectors each containing four elements. These arrays are used in the run up, and a non-zero element indicates a played card. As a general in the program, any variable prefixed by the letter M indicates a value used by the $FL(a)$, whereas variables associated with the player are prefixed with a Y.

71

ISSUE 4

```

1000 DEF FN(1)=INT(RND*17)+1
1010 GOSUB 100
1020 GOSUB 1710-1000:1710
1030
1040
1050 GOSUB 1710
1060 GOSUB 1000:GOSUB 1000:1000:1000
1070
1080 IF 1=1000 THEN 1000:1000:1000
1090 GOSUB 100
1100 GOSUB 1710
1110 IF 1=1000 THEN 1000:1000:1000
1120 IF 1=1000 THEN 1000:1000:1000
1130 IF 1=1000 THEN 1000:1000:1000
1140 IF 1=1000 THEN 1000:1000:1000
1150 IF 1=1000 THEN 1000:1000:1000
1160 IF 1=1000 THEN 1000:1000:1000
1170 IF 1=1000 THEN 1000:1000:1000
1180 IF 1=1000 THEN 1000:1000:1000
1190 IF 1=1000 THEN 1000:1000:1000
1200 IF 1=1000 THEN 1000:1000:1000
1210 IF 1=1000 THEN 1000:1000:1000
1220 IF 1=1000 THEN 1000:1000:1000
1230 IF 1=1000 THEN 1000:1000:1000
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1970 IF 1=1000 THEN 1000:1000:1000
1980 IF 1=1000 THEN 1000:1000:1000
1990 IF 1=1000 THEN 1000:1000:1000
2000 IF 1=1000 THEN 1000:1000:1000

```


Diskit 4

To continue our special series for disk users, we bring you a routine which will find those would-be hackers from stealing your thunder

By Les Allan

How often have you written a valuable program, only to discover at a later date that somebody else has given it and taken the credit. Answering me!

Also there are a certain number of users that take delight in corrupting software by changing the text routines etc.

This program routine provides the user with the facility to search code thus making the would-be hacker's job not much more difficult as the scrambled code changes any text.

Getting It In

Make sure that sufficient room exists on the disk prior to "loading" up "PROGRAM.DISKFILE" extension file, one runs disk block a word on the word file. Press any key on the keyboard to enter the scramble code when the filename of the program to be scrambled and press RETURN (q=quit) file separator.

The program is then loaded memory and moved back to disk as "FILENAME" where filename is the name of the program.

The routine will 70 bytes in the text code as the only limitation on the code is that the original program must start between 9000 and 9010. Data is 300 blocks are used that will move to different room on

the disk. As I am sure you are aware each block is allocated 256 bytes but all may not be used.

Once the text program is completed the program is run as usual, as the limited protection will not be confirmed as successful by entering RETURN.

The program must be typed in

exactly as listed and saved prior to running. Error trap routine are included to ensure that the data is read is correct. The program when run alters the relevant code at a temporary address of 9000 and when prompted returns the working program to Basic (90001) and saves the program to disk.

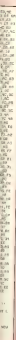
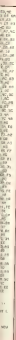
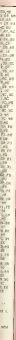
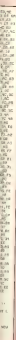
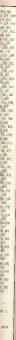
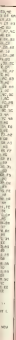
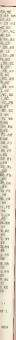
PROGRAM SCRAMBLE ROUT

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02 00 00-0000 00-0000 00-0000 00-0000
03 00 00-0000 00-0000 00-0000 00-0000
04 00 00-0000 00-0000 00-0000 00-0000
05 00 00-0000 00-0000 00-0000 00-0000
06 00 00-0000 00-0000 00-0000 00-0000
07 00 00-0000 00-0000 00-0000 00-0000
08 00 00-0000 00-0000 00-0000 00-0000
09 00 00-0000 00-0000 00-0000 00-0000
10 00 00-0000 00-0000 00-0000 00-0000
11 00 00-0000 00-0000 00-0000 00-0000
12 00 00-0000 00-0000 00-0000 00-0000
13 00 00-0000 00-0000 00-0000 00-0000
14 00 00-0000 00-0000 00-0000 00-0000
15 00 00-0000 00-0000 00-0000 00-0000
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25 00 00-0000 00-0000 00-0000 00-0000
26 00 00-0000 00-0000 00-0000 00-0000
27 00 00-0000 00-0000 00-0000 00-0000
28 00 00-0000 00-0000 00-0000 00-0000
29 00 00-0000 00-0000 00-0000 00-0000
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34 00 00-0000 00-0000 00-0000 00-0000
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38 00 00-0000 00-0000 00-0000 00-0000
39 00 00-0000 00-0000 00-0000 00-0000
40 00 00-0000 00-0000 00-0000 00-0000

```

[illegible]

[illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible]

C16 Games

*Specially for our C16/Plus/4 readers, we
bring you a selection of the latest
entertainment software for your computer*

By Paul Eves

DIAMOND MINE

Diamond Mine is one of those games that is difficult to get to grips with at the start. But for some reason you have to keep having 'game over' more go.

The idea is to push your page through the mine to reach the diamonds. You have to avoid contact with the walls and traps, otherwise you lose that much page and you have to start all over again. On each level, the length of page you have to start with goes less and less, then continues at the top left of the screen.

Movement of the page is one of those infuriating types on wheels. Once you start to move, you cannot stop. Therefore you not only have to be accurate, you must also have quick reflexes.

Although this looks a very simple game, there is quite a lot of hidden strategy involved in actual play. Pick the shortest route to a diamond, not the nearest, for example.



Although the graphics are simple, most of the screen is comprised of walls. I quite liked them. Overall a difficult game to master but well worth the effort.

Touchline

Title: Diamond Mine; Company: West Babylon Software Ltd; C16/15 Home; Berken Road, Danmore, South Yorks; Price: £9.99

Originality: 5/10; Playability: 7/10; Graphics: 5/10; Fun: 7/10

MAGICIANS CURSE

German Graphics has produced one of the better games for the C16/Plus/4 for some time, with Magicians Curse. Long ago, this land was inhabited by an evil magician. His land is now inhabited by an evil magician. You'll be fighting him many, evil magicians used to exist.

The point about it is to avoid the land of all enemies and where the secret is a golden sword. Before you achieve this goal, however, you must also collect seven talismans. There can be found in various places just lying around.

What you are here running from trees to trees, your village is quite modern and getting low and low. To construct this, you need to either drink some poison, or eat some food. A couple of the houses will send a lion to give away, while the underground stream will send some light waves to navigate.

Navigation is not quite that simple. There are the old computer bits looking around and telling you to dodge. Be



useful when points you are near it there is presented (find the random quack).

Considering the lunaticism in programming the C18, this is quite a good game. I especially liked the animation of the birds on sticks to be seen anywhere. Also the stars twinkling in the night sky is pleasing. Well done Gamstar.

Teacher

File: Mystery Cave Company—Graphic Graphics Alpha House 10 Carter Street, Salford, S4 4PS. Price: £8.95. Difficulty: 4/10. Playability: 6/10. Graphics: 5/10. Value: 5/10.

DIAMOND MINE II

Having completed Diamond Mine, you have now entered all your new found wealth into opening an even bigger mine. Diamond Mine II is, virtually the same as its predecessor except that there are a couple of variations.

In this version you have the option that keep your wealth intact going. This time you can walk the mines up and your pipe, however after a time they will collapse in on each other.

If you try to cross over your path, or go back the same way a life is lost. You can, however, retreat your pipe by pressing the return key. This feature of the game makes it a lot better to play than the original. You now have the ability to play your mines a lot better. After the 10th level the mines become 'invisible', making your task that much harder.

Teacher

File: Diamond Mine II Company—Mike Nelson Software Ltd. 125 River Street, Red Bank, South Yorks. Price: £10. Difficulty: 5/10. Playability: 6/10. Graphics: 5/10. Value: 5/10.

PINPOINT

For those of you that have seen Marble Madness Pinpoint will hold no mystery. The concept is the same. You have to reach the white flag with your jumping top. Having achieved this, you go on to the next level.

Amco has been produced a game that should be very popular. I say should be, but I have no reservations. The main problem is that the game is just too difficult to play and enjoy fully. Control of that top is the problem, and you need to be very precise in your movements.

There are the usual steep slopes to climb, and the ones to leap. The downward slopes tend to be tricked with slowly reducing you loss your top off the edge. Unfortunately, instead of some what looking, and I fear you will soon tire of the 'dit, dit' everyone has love a top.

The rules card informs you that there are 10 levels of difficulty, but I must confess to only reaching the fourth one before abandoning the play. The graphics are fairly good being the two colour variety.

Review of Marble Madness and Pinpoint will obviously have this one as for the rest of you I have doubts.

Teacher

File: Pinpoint Supplier Amco Software 4 Westgate House, Spald Street, Bedford, Beds, MK4 1PT. Difficulty: 5/10. Playability: 4/10. Graphics: 6/10. Value: 6/10.



SPIRIT HAROLD

For those of you that have seen Spirit Harold will be one of those. It's a not enough game, but I think it looks that acceptable quality of 'arcade' game.

The idea is that you have to help Harold collect as much grub as possible, to help him hibernate for the winter. The grub is scattered around mainly of apples, grapes, pears, pomegranates (What is that?) and more (Review not too much).



You have to visit various locations to collect the real grub, such as Ghast with minis, at varying rates. All the minis have one thing in common, that is, they kill you on contact. This isn't too big a problem since as you start off with 25 lives.

The simulation of the minis is done very well. My only gripe is the 'Character Detect' routine. It takes some time before you can really judge mile distances.

In your wanderings you will, from time to time, come across a road. Picking this up will give you an extra life. Just one point, the weatherman has predicted a severe frost in the next 24 hours. This would obviously kill our Harold as you must succeed in your task before the time runs out.

Spiry Harold is basically a platform game, which is either love or hate. Overall not a bad average.

Touchline

Title: Spiky Harold **Company:** Firebird, 24 Box Oxford
Score: London 8004 175, Price £1.99
Originality: 4/10 **Playability:** 5/10 **Graphics:** 4/10 **Value:** 5/10

DANGERZONE

There is no escaping the fact that some people enjoy the idea of blasting something that moves. It must be an adult desire that humans suffer from. Dangerzone lets you do just that.

As test pilot for the AT/89 Fighter come reconnaissance ships you have to blast your way through 20 levels of intergalactic hell. The higher the level, the faster they come at you. There are also the odd mine or alien craft to bust as well as you need to keep your mind on your firing as also.

The shooting is definitely smooth, and on the higher levels fast as well. My only real criticism, is that you are only made to use all two directions (up or down).

Your ship is equipped with rapid fire lasers. However constant use of this facility soon depletes your weapons, so use this with caution.

Flying without firing will increase your life-power but

watch out. The action is fast and furious, but I feel that a couple of hours play is more than enough of this one.

Touchline

Title: Dangerous Company **Company:** J. Benjamin
Score: Eastern County, Benmore, Coln, Benmore, 0816 383
Originality: 2/10 **Playability:** 4/10 **Graphics:** 4/10 **Value:** 5/10

ASTRO PLUMBER

You can be forgiven for thinking that you have won the game before. The truth is you have. I know this as before is Super Pipeline and Super Pipeline II by Taitex on the disk.

I am not putting this down though. It's very good indeed. You are the maintenance man just returned from Earth. Your job is to repair the leaking gas pipes that serve Colours II and the station. (The underground servers are inhabited by the usual nasties that have to be avoided. To aid you in this task you are wearing a jet pack, which I couldn't quite master).

You use your Plasma laser to repair the pipes. But excessive use drains your supply, so use with caution. You can leave a warning without completing all repairs, but when you return to that section, the leaks have reappeared.

You can see the air tanks on the surface of the moon to replenish your supply, but unfortunately you cannot use the jet pack whilst on the surface. When the pressure indicator for the level you are on shows full, you will be awarded a bonus point, and you then progress to the next round. (2)

Touchline

Title: Astro Plumber **Company:** Alex Robins Software Ltd,
Score: 1000 House, Bickley Road, Dartmouth, South Tynes, Price
£3.99
Originality: 5/10 **Playability:** 2/10 **Graphics:** 2/10 **Value:** 2/10



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Diskit 5

Disk users take heart. Here we provide a handy disk routine to convert memory to data statements.

By Lee Jones

There are occasions when it is desirable to convert a section of memory from raw, hex code to a Basic program containing a re-basis and set of data statements that represent the original machine's memory.

This program provides the user with the facility to "read" sections of machine memory to do just that! In fact the Basic loader for this program was produced from the very same routine.

Machine Memory

Start and end addresses are entered to cover the range of memory to be converted. These are POKEd into the machine code routine resident at \$C000 which re-bases the Basic loader and performs the operation of reading each byte to provide two digits, hex number on the data statement e.g.

```
0000 00 00 00 00 43 42 4D 00
01 DATA 00,00,00,43,42,4D,00
```

This process is repeated for every byte within the range as previously specified. The assembled data listing is then saved to disk as DATA and should be a loaded pair in memory to match start of variables which begin at the end of the Basic loader.

The \$A5 address associated in the Basic loader is the zero start address and should be modified to that required by the nature of the area of memory being converted.

The program must be typed or stored as listed and saved prior to running. Since trap routines are included to ensure that the data is read in context. The program when run shows the relevant code via computer address of \$0000 and when prompted releases the working program to Basic (\$0001) and reverts to the program to disk.

Program Listing

```

00 10 POKE $C000,POKE($C000,$C000)
01 10 PRINT$(100,100,100,100,100)
02 10 PRINT$(100,100,100,100,100)
03 10 PRINT$(100,100,100,100,100)
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94 10 PRINT$(100,100,100,100,100)
95 10 PRINT$(100,100,100,100,100)
96 10 PRINT$(100,100,100,100,100)
97 10 PRINT$(100,100,100,100,100)
98 10 PRINT$(100,100,100,100,100)
99 10 PRINT$(100,100,100,100,100)
100 10 PRINT$(100,100,100,100,100)

```


1998

Split Sprite

Many programmers find that sprite manipulation can be hard work. Perhaps this program will make things a little easier.

By S.J. Chance

While developing a machine code program recently, after the usual paperwork, I thought it might be worthwhile to do a rough sketch of it on Borex. Slowly it might be that it's a good way to find out a few errors in logic and structure, which might otherwise only be uncovered after hours wasted producing redundant code.

Immediately, an idea or problem I intended to use more than eight hardware sprites in the program, and of course it is quite impossible to write a master interrupt routine in Borex. For the sake of thoroughness, I shall explain the nature of master interrupts for the uninitiated.

The image of your monitor is made up of two 8-line horizontal lines running across the screen in a series of horizontal lines, each line starting just below the previous one. This pattern of lines is called a raster.

Now as we all know, the VIC chip is a Hi-supports eight hardware sprites. However, if you put your sprites at the top of the screen, and then use a master interrupt to load out when the raster has travelled far enough down the screen to have drawn those sprites, you

can then reposition them fairly close to the screen so that when the raster gets to their new location it draws them all over again. And when you reposition the sprites you can also change their colour and definition.

I decided to write a routine which would move some master-interrupt sprites available from Borex. This was quite straightforward, but caused a few problems. I had written on a sheet of paper a routine which would move 768 lines per second. With all that going on, Borex was running at about 1/4th its normal speed. With potentially 40 sprites in comparison, in addition to whatever else it was doing, it became clear that Borex would need helping out.

I extended Borex with a set of sprite commands to set sprite parameters and move them around. Although this slowed down the interpreter even more, the new commands were more efficient and therefore resulted in a net increase in speed. These commands are listed in Figure 2, and I will see more about them later.

Returning to Figure 1, you will see that it shows the screen divided into rows 0 to 4, and last sprites 0 to 4. The

rows are the raster, in which the top edge of an unexpanded sprite can be positioned such that the sprite is close to the master-interrupt drawing stage and below it.

If a sprite is positioned in half space, part of it will be above the master interrupt line and will be dealt with the sprite parameters in the adjacent row. To prevent the sprite from looking as if it has been torn in half, it must be "linked" to the equivalent sprite in the next row, so that sprite must share the same parameters. If this all seems a bit off, basically it will become clearer later on.

Understanding the Commands

Looking again at Figure 2, all the commands are prefixed by the π symbol. This is not intended as a source of inspiration, but rather as direct handling of the commands away from the normal interpreter. You will see that many of the commands use the word π .

[cont'd on page 3]

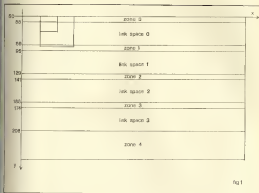


fig 1

where zone=0 to 4 and space=0 to 3. From now on I shall refer to a specific spot by these parameters e.g. sprite 5 in sprite number 0 in zone 1.

Having said that, the Basic extension supports a far easier way of specifying a sprite. Consider the command `SYPO` on Figure 2. When programming a sprite with this command it is important that the y co-ordinate falls within the specified zone. This is easy enough to do using Figure 1, but there is an alternative system. This is to assign an integer array relative to the sprite, replacing `[zone]`, `[sprite]` in the syntax. For instance, suppose I give the command

`SYPO 2(0,10)`

positioning sprite 0 in zone 2 at y=100. This is correct as $y=100$ falls within zone 2. However, if I give the command

`SYPO 0(0,100)`

the sprite will be positioned exactly as

before, and the correct zone number will be written into `C0000` i.e. `C0000` will now equal 2.

`SYPO C0000,100`

will move the sprite into link space 1, so it will automatically be "locked" to sprite 3.6 as its parameters will be

equalled into space 3.6. `C0000` will still equal 2.

`SYPO C0000,100`

moves sprite `C0000` into zone 1. Sprite 3.6 will automatically be disabled, and the value of `C0000` will change to 1.

Using this system it is quite

Figure 2

<code>ENR [zone][sprite]</code>	enable sprite (i.e. make sprite visible)
<code>DOFF [zone][sprite]</code>	disable sprite
<code>EXPO [zone][sprite][x co-ordinate]</code>	set X Position
<code>EYPO [zone][sprite][y co-ordinate]</code>	set Y Position
<code>EFPM [zone][sprite][definition no.]</code>	set pointer to sprite definition (i.e. FRM#)



LMNO [xccc][ypprr]	set sprite to basic mode (i.e. MAND)
EMUL [xccc][ypprr]	set sprite to MULA colour mode
ECOL [xccc][ypprr]	set sprite COLOUR
EMCO [xccc][ypprr]	set MultiColour 4
EMCI [xccc][ypprr]	set MultiColour 1
ESTX [xccc][ypprr]	STretch X
ESTY [xccc][ypprr]	STretch Y
IPRI [xccc][ypprr]	set priority sprite as PRIOR
IBAC [xccc][ypprr]	set priority sprite as BACK
IACT [xccc][ypprr][integer array element]	returns 1 in ARRAY% (SPRITE) if sprite is on (i.e. ACTIVE), returns 0 if sprite is off
DIRT [xccc][ypprr][integer array element]	returns 0 in ARRAY% (SPRITE) if no collision, 1 if sprite to sprite, 2 if sprite to data, 3 if both
EMOV [sprite integer array][x offset], [y offset][number of moves][x integer array], [y integer array]	MOVes sprite through (x,y) for set number of moves, storing the new coordinates in XARRAY%(SPRITE), YARRAY%(SPRITE)
EP [pprr]	sets the Pace of BASIC relative to the movement of sprite, from 0 to 200 0=BASIC slow/sprite fast 200=BASIC fast/sprite slow
LR	loops all sprites (being MOVED, and others LINKed, 0-4 Rows)
EQ	Queue up all sprites
STS 40132	cold start
STS 40133	warm start

parallel to move sprites vertically about the screen as long as the relevant sprite is the first one available. A sprite expanded in the y-direction (ESTY) will always need to be initialised (EYPO takes this into account) but the sprite must be expanded before EYPO is called.

This alternative version is, used with all the statements with the [xccc][ypprr] parameters, in which case these commands will affect the 'linked' sprites also. However, please note that the INTERIOR ARRAY must be declared before it is referred to in one of these commands. This also occurs naturally when an initial value is assigned to an element in the array, but if not, an "undefined statement" error message will be given.

Moving Sprites

A command which takes this idea even further is EMOV. This command moves sprites by looking (1) on to what I call an 'intercept' routine, which is like an interrupt routine, but moves pixels as it waits for Basic to finish its previous command before taking over a sort of multi-tasking.

EMOV C%(7),24,40,C%(7),TACT%(7)

will move sprite C%(7) from (x,y) to (x+24,y+40) 10 times, each time saving the new coordinates in C%(7),C%(7). The frequency of these moves against the speed of Basic is controlled by the TACT%(7) command, whose pace can have any value between zero and 200. Again, the relevant array is used to declare before the command is used. Up to 20 sprites may be EMOVED in any one line.

Other commands, whose parameters are an array are IACT and DIRT.

The Demo

Linked with the SPLIT SPRITE LOADER, is a demonstration program, using many of the new commands. It is probably more constructive to RUN this while following the listing, which have tried to make as clear as possible. The program waits between the runs, so you can work out what is going on.

Before loading the demo program, make sure you have run the one line

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al case is
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need to be
to account
ed before.

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to be con-
sistent
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empty, but
not error

the array
dimensioned
to what
which is
the array
link to
over.

RY(4)

(1) is
a array
(7474)
in .mov
dimensioned

not proc-
and must
be saved
if used

h pers
CV and

SPRITE
program
and has
a RUN
which I
could
a macro
which is

program
to find

162000 SET-UP program, which
moves the location of almost any
memory to make room for the sprite
locations.

When running the demonstration
program placed into the last position
which uses the CHIT command to
draw columns. As the sprite moves
back and forth, even so often they
demonstrate a work area in the system,
when a perfectly good collision is not
registered. This is because it takes a
short time to transfer all the data to
and from the VIC registers at each
interrupt, and so a north is sometimes
supplied that VIC is looking in the
wrong direction when the collision
occurs. In fact there are some dead
spots in mid "link space" where no
collisions are registered at all. If this
annoys you, a little help to use a
different sprite function, or suppress
the collision, to occur in a different
port. Alternatively, a more reliable
system is to check for collisions by
comparing the array elements
containing the sprite co-ordinates.

When writing a program using
SPRIT SPRITE, it is important to
remember that changing a list of
data or re-defining the program
destroys the variables. If there is call
a sprite loaded onto the MOV routine,
then you must enter any data
contained the MOV routine will be
called and will be unable to know the
current state. This will give an error
message, which does not really matter,
but the way to avoid it is to execute 18
beforehand.

SPRIT SPRITE itself is programmed
into a Basic Loader. When POKE'd
into memory, the program resides in
162000—162047. Life will obviously
move from it once loaded, you must
be back at memory for future use
with machine code monitor.

The program uses the rest of the
162000 along with 162048—162050
to store variables that is established by
SPRIT 16212.

A final thought of you do write a
macro with SPRIT SPRITE and
monitor/monitor in tape, make sure you
Open the program first to avoid naming
problems. As I would have to be
responsible for the kind of game it
registered when, while writing
SPRIT SPRITE and preparing to
make a backup copy of my work so
for I randomly re-formatted the
disk and I had it on. Again? 75

PROGRAM: 162120 LOADER

```

00 20 PRINT:GOTO 162000
01 20 162000-162120 C=0 FOR C=0 TO
02 20 162000-162120 C=0 FOR C=0 TO
03 20 162000-162120 C=0 FOR C=0 TO
04 20 162000-162120 C=0 FOR C=0 TO
05 20 162000-162120 C=0 FOR C=0 TO
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Arcade Action

Hints, tips and programs to help in writing your own arcade games

games

By Tony Crowther

Producing your first arcade game need not be the difficult chore that some people believe it to be. All that is required is a good working idea as to the format of the game and an understanding of how all of the different parts are going to work.

In order to produce a quality game then it should not come as a surprise if machine code is a lot harder to write a program in machine code than Basic; however the increased speed of execution is justified as a good program.

It is outside the scope of this series to actually teach you about machine code. Should you be interested in learning then you could take a look at a series *Windows to the Machine* that started in the March 88 issue of *Your Commodore* and finished in December, '84.

I am aware that many people will not be ready to tackle the rigours of machine code just yet. Don't let this put you off. Many good programs are written as a mixture of Basic and machine code.

During this series I will be presenting a series of small programs that you can use yourselves either as part of a larger machine code program or simply copied into within your own Basic program.

The series will be concentrating on programming with the C64; if you are a C16 or Plus/4 owner don't worry; whenever possible I will provide programs that will work on these machines.

What's to Come

So what will we be looking at? For a start I will be discussing the use of User Defined Characters within your programs, how to use them and move them. Sprites will be dealt with in detail complete with routines to animate them and move them around your screen. Many games use backgrounds that are larger than the screen. The screen acts as a window over the larger playing area. I will be explaining how this is done and again provide routines to do this in your own programs.

A number of miscellaneous routines will also be provided for your use. These will include routines to send messages on the screen, print and translation tables, character tables, music programs and many more.

Presentation

Most of the programs that are presented in this series will be in machine code. I will be giving both the source code for the program and a Basic loader for those of you who don't want to tackle the assembler.

The assembly language programs have been produced using the Commodore Macro Assembler. I have tried to keep the assembly language as simple as possible so should you use a different assembler you should be able to enter the programs with very few changes.

Starting Out

In this month's article I am able to tell you what I am going to make you jump straight in at the deep end and deal with something that is extremely important.

```
10 REM * C16 IRQ DEMO ROUTINE *
20 FOR A=818 TO 842:READ C16-K+C
: POKE A,C1:BEIT
25 IF K<>2557 THEN PRINT "ERROR
IN DATA":STOP
30 DATA 220,189,63,141,20,3,189,
3,141,21,3,88,96
40 DATA 163,0,142,25,255,202,308
250,76,14,206,0
50 PRINT"[DOWN][DOWN] SYS 818 TO
START"
```

```

3 REM * C64 INTERRUPT DEMO ROUTE
4 RE *
10 NL=1 :LN=30 :SA=49152
20 FOR L=0 TO NL:GX=0:FOR D=0 TO
13:READ A:GX=GX+A:POKE SA+L*16+
D,A:NEXT D
30 READ A:IF A>CK THENPRINT"ERR
OR IN LINE":LN=LN+1:STOP
40 NEXT L
50 DATA 120,169,13,141,20,3,149,
192,141,21,3,88,96,142,0,142,148
0
60 DATA 32,208,202,208,250,76,49
,234,3,0,0,0,0,0,0,1284
70 PRINT"[CLEAR][DOWN][DOWN][DOWN
8]SYS 49152 TO START FOR C64"

```

FIGURE 1

is a great writer — interrupts.

In the coming months I will be going back to simpler subjects, however some examples that I will be going will require a knowledge of interrupts and use the IRQ program that I am going to give this month.

Let Me Interrupt

So, just what is this thing that is so important to games writing? Well it's quite as simple as its name suggests: it is an interruption of whatever the computer is doing. Let me illustrate what I mean with a simple everyday example.

Let's suppose that you are having a conversation with someone and the telephone rings and interrupts your conversation. You leave the conversation and go and answer the telephone. If the call is for you, then you would now hold a conversation with the person on the other end of the telephone. When you had finished you would put the telephone down and go back to and continue your original conversation.

What has happened is that the ringing of the telephone simply interrupted and paused your original conversation for a short while and you moved on where you left off upon returning.

So what about interrupts in programming?

Let's take a look at a practical example. If you want to write a program that requires you to move a

sprite across the screen you may write a routine that went along the following lines:

1. This is the main program.
2. The game program becomes interrupted by the routine that moves the sprite.
3. The sprite is moved by the routine.
4. Once the sprite has been moved we go back to step (1) and continue where we left off.

This is of course an over simplification but should give you an idea of what an interrupt can do.

FIGURE 2

```

10 ***** BASIC INTERRUPT DEMO ***
20 * INTERRUPT / PLANNING *
30 * SQUARE COORDINATION *
40 * C64 SYS 500 N
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sprite or do not want to pause it entirely being interrupted every 1/50th of a second by the computer's hardware. Everytime an interrupt occurs the computer takes a look at a memory location which holds information about where the interrupt program is stored. These couple of memory locations are referred to as the interrupt vector. In normal use whenever an interrupt occurs the interrupt vector holds the address of the general routines which look when the general running of the computer. These routines are known such as scanning the keyboard to see if a key has been pressed etc.

The interrupt vector is stored at the following memory locations:

750 and 756

These locations are the same on all the Commodore machines we are using.

So how do you use them in your own program?

In Practice

Let's take a look at a practical example. Figure 1 gives a Basic loader for a machine code program that uses interrupts. Note there are two versions of the program one for the C64 and one for the Plus4 and C16.

```

1000 REM C64 IRQ DATA BASE LOADE
R
2000 FORL=0TO9:GX=0:FORO=0TO15:R
BADA:GX=GX+A:POKE49152+L*16+O,A:
NEXTO
2010 READA:IFA<0:EXTREMPRINT"ERRO
R IN LINE":(3040+(L*10)):STOP
2020 NEXTL:END
2040 DATA120,162,0,169,0,157,63,
3,232,234,192,144,248,162,0,169,
2045
2050 DATA0,170,157,0,157,157,0,1
38,157,0,159,232,208,244,169,81,
2049
2060 DATA157,88,192,169,192,157,
89,192,232,232,232,224,50,144,23
9,169,273H
2070 DATA0,141,14,220,169,82,141
,20,3,169,192,141,21,3,169,0,148
3
2080 DATA141,18,208,169,27,141,1
7,208,169,1,141,23,208,141,26,20
8,184H
2090 DATA88,94,169,1,141,25,208,
32,0,0,32,0,0,32,0,0,42H
2100 DATA32,0,0,32,0,0,32,0,0,32
,0,0,32,0,0,32,192
2110 DATA0,0,32,0,0,74,49,234,12
0,169,49,141,20,3,169,234,129H
2120 DATA141,21,3,169,1,141,14,2
20,169,121,141,23,208,169,240,14
1,192H
2130 DATA26,208,88,96,255,255,25
5,255,255,255,255,255,255,255
5,255,347H

```

FIGURE 3

When you run this program it simply POKEs a short machine code routine into memory. To start the machine code routine simply type the 815 instruction which is generated by the program.

What the program does is to change the border color every time an interrupt occurs. Because interrupts occur extremely quickly the flash rate is so high that the different colors appear as a number of flashing bands.

You may notice that the border is still flashing even though the computer has returned to the READY prompt. You can tell any program that is in

memory or even type in a new program and the border will continue to flash. This is because, as I stated earlier, the computer is always being interrupted every 1/700th of a second and our border screen flash routine is run every time an interrupt occurs.

The Machine Code

So let's have a look at our machine code program and have a look at what it does. (Figure 2 gives the source code for the C64 version of the border flash routine. The C18 version is almost identical apart from the locations that

we need to change the border colors.

The program is actually in two separate parts. The first routine actually alters the IRQ vector so that it holds the location of our border flash routine, section two of our first demonstration.

Taking the program line by line this is what it does:

1. We turn off the interrupts with the SED instruction. The reason for turning them off is quite simple. We are going to change the vector that's jumped to when an interrupt occurs. These interrupts occur every 1/700th of a second, if we didn't switch off all the interrupts then it is possible that a interrupt would occur before we had changed both memory locations. If this was the case then the computer would not jump to our routine but rather to some other location in memory and the computer would probably crash.

2. After turning off the interrupts we alter the IRQ vector so that it points to our border flash routine.

3. Now we turn the interrupts back on.

Of course the interrupt vector will change until you execute the program with a 815 instruction.

Our border flash program is extremely simple, all it does is to load the X register with the number 0. This is then stored in the border color location. The X register now has 0 subtracted from it. Note in machine code if you subtract a 1 from a memory location that contains a 0 it will become 255. The program then loops around until the counter gets back to zero when it jumps to the normal interrupt routine - keyboard scanning etc.

In normal interrupt routines when I mean to do so jump to the routine that is normally executed when an interrupt occurs. In other words, we jump to the routine whose address is stored in the IRQ vector when the computer is switched on.

Going Further

I hope that the above demonstration and supporting material makes it a little clearer as to what an interrupt is. The interrupts we have been dealing with are hardware interrupts that are generated every 1/700th of a second.

There are other ways of generating interrupts. For example, the motor interrupt which we saw in the interrupt depending on the position of the motor on the TV screen. However, at this time we don't really need to go into the other types of interrupt as we will deal with them as required.

IRQ Database

As I have already stated we will be using interrupts quite frequently within the screen. In order to make this easier to use with our numerous pages you will find in Figure 1 the

Block loader for a C64 machine code routine which I call IRQ DATABASE. Figure 4 has the source for this for those of you who want to follow it through and see how it works.

This program functions by setting up a table base of switches which are used to turn each routine on and off.

Each routine will be allocated a position in the database and can be turned on and off by simply POKEing a 1 or 0 into the relevant location of the database. For example, as the C64 should you enter

POKE 138,1

then the Message Scroll routine will be enabled. Of course the Message Scroll routine needs to be present in memory and that will be pointed to a later part of the series.

Next Month

Have you ever wondered how you get moving objects in programs? If any of you have seen either of our *Diaglog* games then the moving characters, balls and ladders are the type of things I mean. Well next month I will provide a routine that will allow you to perform this with ease in your own programs.

1000	*****	1300	IRQ
1010	***** INTERRUPT PAGE *****	1310	IRQ #0
1020	*****	1320	IRQ IRQ#1
1030	*****	1330	IRQ #0
1040	HOW TO USE FROM BASIC	1340	STA TIMER4
1050	*****	1350	LDX #PAGE2
1060	*****	1360	*****
1070	*****	1370	STA CTRV
1080	*****	1380	LDX #PAGE2
1090	*****	1390	*****
1100	*****	1400	STA CTRV+1
1110	*****	1410	LDX #0
1120	*****	1420	STA TIMER4
1130	*****	1430	LDX #0
1140	*****	1440	STA TIMER4
1150	*****	1450	LDX #0
1160	*****	1460	STA TIMER4
1170	*****	1470	LDX #0
1180	*****	1480	STA TIMER4
1190	*****	1490	LDX #0
1200	*****	1500	STA TIMER4
1210	*****	1510	LDX #0
1220	*****	1520	STA TIMER4
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1670	*****	1970	LDX #0
1680	*****	1980	STA TIMER4
1690	*****	1990	LDX #0
1700	*****	2000	STA TIMER4
1710	*****	2010	LDX #0
1720	*****	2020	STA TIMER4
1730	*****	2030	LDX #0
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1780	*****	2080	STA TIMER4
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1800	*****	2100	STA TIMER4
1810	*****	2110	LDX #0
1820	*****	2120	STA TIMER4
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1840	*****	2140	STA TIMER4
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1880	*****	2180	STA TIMER4
1890	*****	2190	LDX #0
1900	*****	2200	STA TIMER4
1910	*****	2210	LDX #0
1920	*****	2220	STA TIMER4
1930	*****	2230	LDX #0
1940	*****	2240	STA TIMER4
1950	*****	2250	LDX #0
1960	*****	2260	STA TIMER4
1970	*****	2270	LDX #0
1980	*****	2280	STA TIMER4
1990	*****	2290	LDX #0
2000	*****	2300	STA TIMER4

Printmaster

Create your own headed paper, greetings cards or other forms of stationery with this program from Amosoft.

By Evelyn Mills

Printmaster by Amosoft is a very extensive program with an overwhelming selection of options which, in my opinion, give it a very high rating in the computer field of creating your own graphics stationery. Performance is smooth, impressive and the program is dedicated to the way in which you use it.

On loading, the main menu gives the following options: Greeting Card, Sign, Stationery, Calendar, Forms, Graphic Editor and setup. The latter is for printer/output options while Printmaster (PM) is a preset for the Commodore 128/601, the printer output will allow connection for Epson, Star, Okidata, Oki and Citizen printers.

Editor

So what do we choose first from the main menu? I would suggest: Graphic Editor so I can see 'what's what' with the graphics on the disk and also to experiment with creating your own graphics. Having highlighted this option, choose 'graphics by picture'. Here you will find 120 preset built-in graphics for your inspection and use! Some of these graphics are substandard, a large proportion are very novel, but each and every one is very well designed for maximum graphic effect.

On display with your graphics, there is a side menu which allows you to edit, draw, invert, flip horizontally, flip vertically, move to disk or print (each graphic occupies three blocks on screen) zoom in and flipping on screen very rapidly on screen. Editing

and creating both have four functions controlled by F1 which handles drawing, shading, toggling and moving. Drawing gives solid lines, shading gives dotted lines while toggling draws and erases where lines cross, the shading and toggling combinations give excellent 3D effects. All functions are joystick controlled, F1 setting the mode of operation for you.

Cards

Greeting Card: Here there are seven borders from which to choose, including a few unconventional ones such as 'traveling with' - the programmers really enjoyed making the software. Eight fonts are available and there is space for seven lines of text (39 columns wide) so there is no need to stick to the usual conventional, cryptic greeting. Both upper case and lower case may be used. Naturally, a graphics extension is available in either small, medium or large mode.

Now the program really gets interesting - you can stagger your graphics in a set manner or place them where you wish. At this point the function keys 1, 3, 5 and 7 interplay with one another. F1 positions writing to left centre or right, F3 shows size, F5 shows style while F7 alters the font. Effectively then, you may interchange position and change look without any one graphic, should you disagree with settings, the screen will be reset and it can be saved out with the delete key. While you are still creating a Greeting Card, there is a From Page and an Inside Page for you to use.

What have you done?

Now keep moving along (plenty of screen prompts) and you will be given the choice to PREVIEW what you have done. This function is an excellent option. If you don't like what you have designed, back up with the key and change it all. For a really radical change go back to the Main Menu and start all over again. If you like it - save the whole thing (asked for me at a later date) (change a few times around when you relaxed if you wish) or print it out directly. Now who could ask for more than that?

The function is operative all through the program and allows you to back up at any point for editing.

Making Signs

The SIGN Facility operates in a similar manner, and gives you a one page presentation with all the facilities described above including seven lines of text.

Stationery naturally creates your own paper heading. Here the graphics may be to the left, to the right, 'lined' or a row of lines. Both the top and bottom of the page are programmable too - the RESTORE key stops printer output - so don't go too far when you will have multiple pages at your feet. On the other hand try, as if a page if you mean!

What's the date?

The CALENDAR, very good in this genre, shows your graphics, and font,

plus months and year. The 12 calendar months are listed and are sorted by highlighting; the year is listed as 1988 which may be changed as desired; you are now asked for a month or weekly calendar.

The Monthly calendar selection gives the menu options, after loading, and enhance data.

With 'after loading' the first way to change with F7 while the rapid loading at the top may be altered with the delete key and input from the keyboard. Anyway assuming that you are quite happy with what you see, select 'enhance data' from the options you are now seeing. There is one of five characters each for any one date to remind you of who's who and what's what. Again you get a preview of your monthly calendar picture.

You, if you choose any particular year, the calendar will start on the correct day and date of that year. Long Year? - of course they are calendar.

If you choose the weekly option you will then be asked for general or specific options. The GENERAL format is not dated and the output is full screen with Sunday to Saturday of any one week (of any one month, of any one year) running downwards with Monday, fixed space running horizontally for you to write on at a later date (as per, pencil or what not). The SPECIFIC format is similar but dated. Again you may have a preview before printing. The Calendar also supports graphics.

Long Notices

On to the BANNER which gives you graphics, fonts and new line of writing up to 24 characters long. This also need F7 for font changing thus allowing you to 'move it up'.

All through the program upper and lower case may be used as can REVERSE MODE for both graphics and print. Fonts can be single, solid or 3D. The 3D effect can be altered in size but what disappears my eye may well please yours.

Now if you cannot create with this program don't blame the back cover boys. They have given you a stack full of powerful commands to implement plus assistance on some instructions. The end result is very pleasing to the

DeVille Scribe Office Hampton Times Western Utopia Computer

eye. The ability to back step, change fonts and words and preview your material before printing is an acquisition - plus the fact that, not only can you save graphics alone, you can save the whole card, calendar, banner or whatever. A five star app! ☺



Timeline
Rome Publishing Price £29.95 Machine
C44 Supplier: Amatech, 68 Liverpool,
Cannon Square, London WC2E 7BN Tel
(01) 834 3477

Percussion Section

Building add-ons for your computer sounds like a daunting task, however Maplin's Computadrum makes it possible for amateurs.

By Neil Day

My friend who knows about such things said I was crazy, to say, but I wanted to build something to add on to my C84. I think I found the ideal beginner's project in a cheap drum synthesiser kit from Maplin's, a large electronics chain and mail order firm.

Computadrum is supplied as a packet of components with a printed circuit board. The kit will work with a number of different models including the C84 and Vic 20. It should also work on a C128 or C64 model, but I haven't tried it.

The unit provides six separate channels, or different drum sounds. Each channel can be tuned for pitch and resonance by altering the voltage of variable resistors on the circuit board with a small screw driver. Software can be used to match each channel on or off and to control the time between each beat. You might think this would give access to an infinite palette. That's not wrong. The six channels can be mixed in any combination. In effect, this gives you access to a large variety of sounds.

I'm told, by my friend who knows that commercial drum synthesisers will do more, and the software provided is lame. The Computadrum has two big advantages over those - you construct it yourself, and, on the grounds I learn a lot about the wonderful mysteries of the real world. That's what I now know to call the hole you can feel on the left-hand side of the back of your C84.

Signals, controlled by the computer, come from this port and are

plugged into the Computadrum unit. Inside the unit these signals are used to generate the six drum sounds. The resulting signals emerge from a lead from the unit that has to be connected to the input or audio-in socket of an audio amplifier or recorder.

The packet supplied contains all that is necessary to house the unit and the leads. For the lead into the drum unit from the C84 computer you need a seven pin dot plug, a couple of feet of twisted wire cable for the six lines plus ground, and a 36 way edge connector to plug into the computer. The output lead will depend on the type of amplifier or recorder as you are going to use. Most commonly a single RCA type plug is required. A very professional looking box to house the unit can be supplied by Maplin for about £9.99. Cheaper ones are available too, or you could probably improvise one.

If, like me, you have never previously assembled electronic equipment, you may start out feeling a bit apprehensive. However, the process is easy. Maplin has a little brochure called *Constructors' Guide* (ref. 61274). It costs just 25p and tells you how to identify resistors, capacitors and other such beasts. I used the magnifying glass out of my daughter's stamp collection to read the values off the tiny components. I used the value letters for resistors and bands for capacitors on to a scrap of paper and then wrapped up the components of the machine together in the paper. This meant that I did a bit

the identification of components (probably the hardest thing of all for me) in one sweep.

Sliding the components into the printed circuit board reminds me of knitting, in a pattern, except it's a lot easier than the furthest sweater I knitted over for 15 months! Some wires need to be inserted correctly so that the pressure and goes through the correct hole in the PCB, but this is always indicated on the very clear labelling on the board itself.

You are advised to poke in a few components at a time, and then solder them into position. You are usually recommended to remove the excess wire protruding from the bottom of the board and repeat the process until all the components are installed.

The last stage is soldering and was, to me, the toughest, that was harder than soldering the components in place. The detailed notes on the *Constructors' Guide* and the project instructions helped me here. Large lumps of flux were used liberally, leaving two hands free for the soldering. The only ones that were at all tricky were the stereo-connections because the pins on these are very close together. (The finer the point on your soldering iron the easier it is.)

Well, putting it all together takes a few hours, but in the process you read the excellent instructions and get a general idea of what each circuit does before long you've soldered the leads and it's time to test the unit.

When data is sent I checked both for windows of solder shorting the

ends on the pole and the correct placement of components. These were all OK. My mistake was that I had assumed that the wire marked "ground" from the seat pan would end up attached to the metal shield round the wire pan plug at the end of the main cable. I was informed by my friend, who knows about these things, that only a person with the brain of a small goat would do this but you still might appreciate the tip. The ground wire has to be connected to one of the seven pan Min-wiring the cable was the only connection point I could

Then fixed. I got some screaming from sounds, but I couldn't work out which of the adjustable reverb controls which of the six voices it carried out to be my immediate understanding of the short program you type in to run the drum. To turn a line up, or "set it high" as they say, you have to push the appropriate value into memory 96877 for instance binary 7660000 turns on the first line and makes the first drum, cilted drums, some wood basses.

00000201) Given an hour, zero and one meaning there was one minute of the symphonies sound simultaneously in the problem was that when the program asked me to type in the drum number, I assumed that I've would give me drum number five and so on but five is a binary 00000101, so it turns on drum one and two together. In other words you need to let the program to take in a decimal equivalent of the binary value of the drum number. If you want drum three you need to type eight (0100) or 4 is the power of 2. So fourth, drum four is indicated as 16 and drum five as 32 or two to the power of five.

All-in-all, building the Compu-drum let a very absorbing, and gives you a good understanding of how the computer can be used to control external equipment. Now I'm looking for a real center DV system that will dance to the pulsating rhythm of my drum machine. He also knows about these things; they should get in touch with one of these companies for more information.

order places that will a special type of reliable notes. He says that what I did when writing up the table would stand me in good stead. You have to get used to spacer comments like those from electronic reports when writing an unusual hardware component. It's

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The Four Commodore Software Service makes available all of the programs from each issue on both cassette and disk at a price of £5.00 for disk and £6.00 for cassette. None of the documentation for the programs is supplied with the software since it is all available in the relevant magazine. Should you not have the magazine then disk notes are available from the following address:

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The Disk

Programs on the disk will also be supplied in totally working versions, so when possible we will not use Basic Loaders that contain any of the program machine code. Unfortunately at the moment we cannot duplicate C16 and Plus/4 cassettes. However programs for these machines will be available on the disk.

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At the top of each article you will find a strap containing the article type. C16 Programs are the that you can see what programs are available on which format you will also find a couple of symbols after the strap. The symbols have the following meaning:



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These programs are available on disk

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Device One

A printer interface is one of the most important items you may ever buy. Device One could be just what you're looking for.

By Stuart Cooke

When Commodore launched its range of home computers, the need to purchase Commodore products as the future was virtually built in. Should you require a disk drive then you would have to use Commodore's. If you wanted a printer then you would have to use Commodore's. All this is due to the fact that the company have a non-standard interface.

Most of the popular printers such as Epson, Star and Citizen come complete with a common interface making them compatible with a Commodore computer. To solve this problem many parallel interfaces have been built that enable you to use a parallel printer with a Commodore though most of them have been as powerful as the Device One Basic Printer Software.

The purpose of Device One is basically to link together a printer with a parallel interface to the Commodore computer. The computer talks to the printer in the normal way, it thinks it is talking to a Commodore printer while the interface makes the printer behave as though it is a Commodore printer.

The usual wiring for the interface is made from what appears to be a Vee28 cartridge case. The only reservations that I have about the interface are partly due to this. Only part of the circuit board is covered and a large proportion of it is visible to the outside world. I can't help wondering if a certain object such as a paper clip could find its way into the interface through the opening and cause havoc to the chips inside.

The interface also features DR of RAM and DR of ROM; there are four banks of character fonts, so you can print letters in different fonts. There is also the facility to print out in your own font print patterns, relations and letters.

Documentation

The manual accompanying the interface was printed on a Device One and at different levels showing the facilities of the interface. The material is extremely clear with many examples used to illustrate different functions.

Most of the different commands are extremely difficult to remember, even though the manual does make it extremely clear how to use them; the interface therefore has its own useful documentation. Help gives the first listing on the interface for most (up to three seconds) and a brief summary of the available commands will be printed out for you.

In Use

Setting up the interface is extremely simple. The interface plugs into the Commodore serial port and the printer connects into A, the other connection is made with a transformer to a convenient mains socket.

The interface will work with most (over 25 different types of printers, all of the popular types such as Epson are not available. Selection of the printer type is simply made by altering the position of three switches on the front of the interface. Other switches determine if you require an autoline feed and the mode of operation of the interface. There are four different modes of operation, 1 (differentiation), as it takes up to 1000 characters, so it takes up to 1000 characters total simulation of a Commodore 1525 printer, you also have access to all of the Device One features such as fonts and relations.

Some commands mode prints all commands directly to the printer without any conversion, however Device One commands will not work.

Transparence mode passes characters straight through to the

printer, Device One commands will not work.

ASCII mode passes all codes straight through to the printer except for characters. Any characters are translated from Pet-ASCII to normal ASCII so that they are printed correctly on your printer.

1525 Emulation

When using this mode all of the Commodore printer commands such as double dot work as you would expect. This means that you can now use any programs that require a Commodore printer without any problems at all.

Device One Control

There are no fewer than 32 different commands that can be sent to the Device One interface. Commands can be sent to the interface in one of two ways. Either you can operate the printer with a secondary address of 15 or 2.

OPEN 4,13

if you can send two escape codes (27) to the interface before a command.

Obviously there are far too many commands available to go into them all so I will concentrate on the more ones.

Custom Fonts

One command will allow you to select the font that you would like to use. There are no fewer than six versions of the Commodore and for many of them you must have downloaded into the Device One the font that you require, this is not the same as one of the four in-built fonts.

You can select a low-res font which

is made up of 8½ dots. You may select a small font which is made up of 8½ dots. A large font may be selected which is made up of 12½ dots on an Epson type printer or 16½ dots on some others.

One of the four on-line fonts may be selected. Figure 1 gives examples of each of these. You may select your printer normal font and Underline can be toggled on or off.

Downloading

In order to get fonts etc into the interface you must select one of the various download commands. Commands exist to download each of the different styles of font as well as

each line of the printer is printed. Should you need text in the printer you could print this over an illustration.

Printing Calendars

There is an on-built calendar made in the interface. This simply prints out a calendar for a specified month on your printer and can be printed in any font.

Buttons

This mode will allow you to print any message (between 40 to 255 characters), each letter of your message being as high as the width of the page.

The *Devote One* does improve these dramatically by printing each character twice. This gives a more professional finish to any programs.

Software

Not only does *Devote One* come complete with its own built in software, it also comes complete with a disk full of it for the C64. The software included is:

Fontmaker 1 - This allows you to convert pictures from most of the popular packages to *Devote One* format.

Font Editor - This allows you to create your own fonts for use with your printer.

Dump All - This prints out your machine and allows you to get a screen dump at any time by holding down a few keys.

Dump Text - Similar to the above but this only prints text.

Draw! - A simple drawing package that allows you to create your own line pictures.

Font Utility - A program that makes printing calendars, buttons or downloading pictures and fonts much easier.

Font Capture - This allows you to go through the memory of the computer so that you can capture any fonts that are used within your programs for use with your printer.

Verdict

Devote One is the most powerful printer interface that I have come across for the Commodore range of machines.

The interface is easy to use and the manual is clear enough for even a novice computer owner to get to grips with the interface without any problems.

The interface is expensive but well worth saving your pennies for, and especially since there are interfaces on the market that don't do as much and cost more.

Footnote

Product: Devote One
Company: Parasoft Software, 4 Paul Trevor, Manchester Park, Epsom, KT9 7GE. Tel: 01 836 7366. Machine: C64/128

FIGURE 1

the quick brown fox jumped over the lazy dogs back.
THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK.

the quick brown fox jumped over the lazy dogs back.
THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK.

the quick brown fox jumped over the lazy dogs back.
THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK.

the quick brown fox jumped over the lazy dogs back.
THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK.

downloading a picture into the interface's RAM, creating a new file so that it is printed in temporary mode and downloading a disk drive in the printer. Downloading is extremely easy once the interface is held to download it is as easy as putting you into the memory information. The easiest way to do this is to VERIFY the file that you require. This file will read into memory but it won't download the file to the interface.

Printing Pictures

Pictures can be printed in either full-size or half-size. Full-size simply means that the image is in black and white while half-size means that the interface will use shading to print out the different colours. In order to print a picture it must be downloaded into the RAM in the interface. This can then be printed in the interface.

Laying It Out

Commands exist within the interface to set the page length of the interface and the left and right margins. For anyone who uses a wordprocessor that doesn't have headers and footers commands the inclusion of this in the interface will be a welcome addition. You could even use headers and footers to print messages at the top and bottom of any listings that you print out.

NIQ

Many people would know how access to a daisy-wheel printer which prints extremely clear characters, however for most of us the price of them is far out of our reach and we are therefore stuck with the dot-matrix printers that our printers provide. The NIQ mode of

CP/M and the Commodore 128

CP/M, much neglected mode of the C128, is probably the most useful for the serious user. Here we examine the Commodore version of this phenomenon.

By Microsoft Appleby

There are differences between the beloved CP/M and the Commodore implementation; however, this article should enable you to understand just what these differences are, plus I hope to give you an idea of the more common (troublesome) programs supplied with the CP/M+ system.

The Commodore Connection

If you read my article in *Your Commodore*, March 1983, you should remember that the CP/M system as now defined, requires a 288 processor, 64K, an 80 column screen and one or two disk drives. The CP/M+ system supplied with the C128, assumes 128K.

In the Commodore implementation there are a couple of changes made to that initial specification. The screen can be set either 40 or 80 column mode and, as most people can only have one disk drive, there is a software mechanism for treating it as two separate drives to make copying and various disk functions easier.

This is achieved through the use of drive 'D'. Naturally to copy between two disks you need two drives, for instance 'A' and 'B'. The computer takes the information off drive A and puts it on to drive B. That works fine for dual drive systems, but again Commodore's only have one drive which makes things rather difficult. So, Commodore came up with the drive 'D' screen. Specifying a copy between drives A and B in the sample disk copy with drive A referring to the original and B referring to the copy. Although, you can do it the other way around. The main point is that drive D doesn't exist. Only in the minds of the system's

programmer and everybody knows that most systems programmers are damaged anyway. This system is very good and simple to use and is a brilliant way around a rather tricky problem. It's much more useful for Commodore to leave something like this for the user to sort out.

On Screen

The other anomaly in the Commodore CP/M system is the ability to get a 40 column screen. This is for the legends of C128 owners who have an 80 column monitor but just one of the old composite colour monitors or TVs. It operates by having a 40 column window on a logical 80 column screen. Everybody must recognise this from a large number of workstations that run on the C84. This is probably the most ideal solution and the only real way to get some of the software working. This said, it is probably better to find a cheap good screen monitor and use that instead. There are some very good ones nowadays for around \$50 and it is worth the investment if you are going to use CP/M for any length of time.

Though CP/M+ was designed to have a certain amount of room in the OS for graphical links, CP/M 2.2—the overking version that most CP/M programs were written under—has none. So most CP/M programs are in monochrome anyway. Other than that you are best looking to software that will run under 40 column CP/M like languages or programs written for the old C64 version of CP/M 2.2.

On the Record

The other difference that is inherent in

all CP/M systems is the disk format. The disk format is the way that the disk controller tells the disk drive to write to the disk. As most people know, the process of writing to a disk is very similar to that of writing to tape. To take the analogy further, there are different ways of writing to tape and two different writing systems. One is 'bifurcated recording' is used in video monitors and the new Digital Audio Tape (DAT) system. This is incredibly complex and is beyond the scope of this article. The other method is the straight linear recording system.

Using this method, a certain amount of tape will go on the tape head in a certain amount of time. In that time a certain amount of data will be written to the head. There can also be between one and nine tracks on the head. Now as we know, different computers have different methods of writing data to tape, on tape this is known as the tape format. But, on disk, it is known as the disk format. Also the way in which the head writes to the tape is different, effectively how the writing magnetic field of the head affects the tape.

All these differences also apply to disks. The amount of data packed on to a known size of disk, called the sector density and can vary by more than 10 for CP/M disks or 16 and 23 for Commodore disks. The number of tracks on a disk can vary between 15, 40, and 80. There are three main ways of writing data to the disk. Fd, MFd and Commodore CRR. And there are one or two other differences as well.

So, now you can that there are a lot of differences between disks, even

though they use the same name/magnetic pool/disk. Another note: while even use different types of disks (the C128 has to be able to read many formats as possible) is able to make that best use at CP/M. To do this a novel solution was found:

The Solution

In the past, Commodore computers used 32 (or 72 for older machines) inch, GCR, 32 to 16 sectors per track and 256 bytes per sector. This format was dropped from the start to be stable, fast, and waste the best possible use of disk space. And indeed the design of BBR, for a single sided, magc density, 35 track disk has never been better. However, the rest of the world started with very low density disk drives and could only modify their system as the hardware got better.

As you can see, there is no way on earth that an old Commodore drive can read the more standard type of disk. So all you people with 104 (or hard disk) You can use Commodore specific CP/M programs (and there are quite a few available from CP/M) but this won't be able to access any of the generic CP/M stuff.

So, to read CP/M generic disks you need to have either a 1570 or 1571. The difference between the two is that the 1571 will read and write to both sides of the disk and the 1570 is only a single sided drive. What this means is when you could read some CP/M disks in the single-sided drive, you may have to get them specially written or only be able to read half the information. So get a 1571 then it is the same disk as the one that is fitted internally into the C128.

The 1571 is 80 track double sided (double sided means it has GCR or GCR and can hold 300K, 400K, or 640K. This last mode is the double sided Commodore GCR format and is only really used by the C128 as Commodore Basic mode and when booting CP/M 3.00K is available in 32 or single sided mode and the 400K mode is 16M or double sided mode. These two modes could make the C128 read 90% of all CP/M 2.2 disks ever written, but instead, the most popular one was provided. This and covers the vast majority of CP/M disks, they are

IBM 8 sector 55
KayPro II
Commodore 55
IBM 8 sector 128
IBM 8 sector 128
KayPro IV
Commodore 128
Epson QX 10

The first four formats can be read by the 1571. It is interesting to note that the IBM 8 sector 128 is the same format as used by IBM compatibles when using CP/M-86. This was the Digital Research answer to MS DOS; this never really took off. However, many IBM compatibles retain the ability to read or write disks in this format and so does only transfers are possible. Another side point is that the General CP/M machines (PC 484 with disks and CPC 644) and CP/M+ machines (CPL 6128, PCW 1256, PCW 8515) can read and write disks in this format.

Transient Commands and Friends

Last month I explored the concepts and purpose of the transient commands along with some of the simpler ones that are only really necessary at the initial or routine commands. After these come the utility programs that can either be considered as transient commands or as programs in their own right. They are usually used as commands when only one operation is needed, whilst for multiple operations the stand alone program mode is more useful.

The most commonly used, and indeed one of the most useful commands is known by the searchable information name of PIP. PIP stands for Program Interchange Program, and has been called 'the most powerful command ever written'. This was the definition of power that derives from making a lot happen from the least keystrokes possible. However, this is more to do with PIP, considering standardised system than anything else. Effectively what PIP does is to transfer a file from one device perform some action on the file (or not) as the user may be and transfer it to another device.

This command is exceedingly useful, has to be included on the system disk and is rarely ever documented in CP/M instructions supplied with any CP/M machine. So

here is the minimum you will have to know to get it going.

PIPPed at the Post

As mentioned earlier PIP is used to transfer files around. The transient way of using PIP is as is typed 'PIP src' where 'src' is the function that was want to happen. When this is completed or an error occurs you will then drop into the CP/M version prompt (A >). The programmed method of using PIP is just to type 'PIP src' on a row. You then put the PIP prompt which is an asterisk (*) followed by the cursor. To use the earlier example, if you typed 'src' after this prompt it will be used again. The difference is this after it is finished a removable error condition occurs, you will drop back into the 'Y' prompt ready for another command.

The format for the PIP instructions (I will remove from now on what all instructions are following the 'J' prompt) is 'target location source operation'. Either the target or the source can be either a file name or a device and the operation will be detailed later. The file names can support all the wildcards and these designations that the more complex transient commands have. So the most simple example of the PIP command is the disk copy 'A * = B *' will copy the contents of drive 'B' on to drive 'A'. Single files and groups of files can be copied as src or removed. For 'src = del src' will change the src file 'del' into the src file 'del'.

The most use of PIP is to transfer information between devices. 'src = src' will accept input from the keyboard and create a disk that did 'LPT' was not will print out the text file and something like 'SRC' program will read information from the serial port (perhaps from another computer) and create a file with it.

However the most powerful function that PIP has is the operation at the end of each instruction. The examples above will do the transfer with no change in the file being transferred. However, the inclusion of a few letters after the instruction or request brackets can change anything.

Z The screen the party
but the 720 ASCII files
W Overwrite this will

IBM 8 sector 55

Keypad Modifier

Now you can use your numeric keypad to type in lists of data statements.

By Mahmood Hassan Merchant

The Commodore 128 comes with an excellent keyboard which is complemented by a numeric keypad situated on the right. At first glance this would tempt any programmer's hand. You could be mistaken for thinking that it can be used for typing in data statements. But, on closer casual examination it becomes clear that the keypad has been primarily designed for abbreviating data entry with "1", "2" and "3" keys. Most data statements cannot be entered with it. Or can't they?

I realized, thus with a little effort, the keypad could be modified to meet the need. Hence the birth of the Keypad Modifier.

Purpose

This is a machine language utility which resides in the unused RAM at \$000. This start location is defined in line 40 as variable AD. The value of this can be changed if required and a working version of the program will be published in that location and comments.

The program modifies the "1" key as DEL. This is useful when you make a mistake in your data statements. The "2" key is located on the top right of the keypad just like the DEL key on the normal keyboard, and this makes it very convenient to use.

The "3" key when depressed, prints the word DATA on the screen. The

command required to separate the numbers in a data statement is now available using the "4" key. The number and ENTER (or RETURN) keys act as usual.

Hints on Loading

The Basic loader accompanying the program POKES the data if you own a disk drive; the loader will protect a binary file with the name you specify. Later, whenever you want to use the editor, just enter BASIC "FILENAME" to load and execute the modifier.

These users can enter the built-in MONITOR and save the machine code with \$7FILENAME, \$00+\$000+\$007. The machine code can then be loaded with LOAD "Filename" 1,1. You should then type NEW and SYS \$000 to restart.

In Use

The best way to use this utility is to first use the AUTO feature of Basic. Type in the first line number and press space. Now you can forget the usual handwritten list from the "1" at the beginning of a new line, the number of which will be automatically printed if you are using AUTO. Then enter the numbers privately, "2" to separate lines and press ENTER to enter the line. If you make a mistake press "1" to delete it.

PROGRAM: 128 KEYPAD MOD

```
10 PRINT "LOADED"      100 NEW
20 MODIFIER
30 PRINT "DEMO-1" PRINT "2"
40 PRINT "DEMO-2" PRINT "3"
50 PRINT "1" PRINT "4"
60 PRINT "1" PRINT "4"
70 PRINT "1" PRINT "4"
80 PRINT "1" PRINT "4"
90 PRINT "1" PRINT "4"
100 PRINT "1" PRINT "4"
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940 PRINT "1" PRINT "4"
950 PRINT "1" PRINT "4"
960 PRINT "1" PRINT "4"
970 PRINT "1" PRINT "4"
980 PRINT "1" PRINT "4"
990 PRINT "1" PRINT "4"
```

Go FORTH & *

Tired of your old programming language? Want to try something new and exciting? Then it's about time you checked out FORTH

By Allen Webb

The title of this first article may at first appear odd but it is, in fact, a motto used by the FORTH Interest Group (FIG) meaning "Go FORTH and multiply." When I started to do a private issue's editorial on favour of the use of FORTH as the alternative programming language

Basic Disadvantages

The majority of Commodore users are probably programming in Basic. Whilst Basic adequately fills its original function as an aid to teaching programming, it has serious drawbacks which hinder its use for serious applications:

- a) Basic lacks the structural constructs which ease the creation of logical and easily understood programs. If you're not used to understanding, also not doing a Basic program written by someone else, you'll know what I mean.
- a) Being an interpreted language, Basic is both slow and uses memory inefficiently.
- a) Basic is inflexible.

Two important points must be emphasized. First, the enhanced Basic available to BBC and IBM clone owners are more difficult to use but are

obviously machine dependent. If you want to have a program which is transportable to other machines, forget it. Secondly, you can get computers which will speed up routines and save space. They do not, however, make the job of programming easier.

For all these reasons, many people will eventually become dissatisfied with Basic, and will seek alternatives. Those interested in arcade games will probably choose machine code. Those, however, who do not seek the highest speed execution will want an alternative high level language. For the

CBM/CIB, the alternatives are based on PASCAL, and FORTH. Those of you who own an Acorn will also have the option of C PASCAL (and its derivative MODULA) is a powerful and well structured language but for power, structure, speed and elegance, FORTH takes some beating.

Forth Advantages

I do not intend to describe the FORTH language in detail since the books listed later will do the job better than I can. Instead, I want to discuss the

```

Living !
HEX
DO21 CONSTANT SCREEN-COL-REG
COLOURCHANGE
  ! SCREEN-COL-REG
FLASH FF 0
  DO
    COLOURCHANGE
  LOOP
MESSAGE FF 0
DO
  "FORTH RULES OK" FLASH
LOOP
DECIMAL
  
```

FORTH philosophy and hopefully what your system.

The main difference between FORTH and other languages is its approach to defining instructions or words. In Basic, instructions such as MID\$, 1, PRINT are hard fixed and clearly specified functions or messages. With FORTH and its vocabulary of basic words (primitives), these are completely flexible and may be changed at will. If, for example, you want the instruction % to really represent 11, it is a trivial matter to make the change. The ability to define your own words and add them to the vocabulary gives programming an added dimension. It also makes the creation and use of Procedures both primitive and elegant.

Consider the example in Listing 1.

Here I have defined three words, COLOURCHANGE, FLASH and MESSAGE. Each definition is held in the screen between the and COLOURCHANGE increments the screen colour (on MDG11) by one. FLASH uses a loop to increment the screen colour 255 times. MESSAGE uses the flashing screen effect in conjunction with a printed message to give a cursy effect. The three words are added to the vocabulary and can be used as subsequent words. In other words, a completely new definable language.

If this flexibility wasn't enough, FORTH offers a combination of interpreter and compiler. When you write the program, you are in fact creating some form of text file using an editor. When any word is to be executed, the text is compiled. Since the primitives are efficiently defined in terms of simple machine code jumps, the compiled words are converted to a simple linked list of machine code instructions. The results is compact code which executes quickly.

Inside FORTH

Originally, FORTH was written using virtual memory held on disk. To do this, text is held in a series of screens each comprising of 8192 bytes. Within these screens, the text can be laid out in almost any format allowing the use of

interesting and often tricky to give a well structured format as shown in Listing 1. Some rules (84 rules don't own a disk drive) many FORTH users RAM disk approach to storing screens. While the software is different, the generated code of operation is unchanged. The system and text input is extremely sensitive over the use of virtual memory as disk presents no problems for using explanatory comments. Listing 3 shows what can be done.

In terms of capabilities, standard FORTH offers all of the structure you

Most of the speed and power of FORTH derives from its use of a stack to hold values currently in use. Not only does the stack allow the rapid manipulation of data, but values can be easily passed to words. The word DUP in Listing 3 is used to duplicate the value at the top of the stack. The functioning of the routine is as follows:

1. The routine is entered with the number on the top of the stack.
2. It is duplicated to preserve it and it is decremented.

Listing 1

```
FACTORIAL (n - factorial)
DUP 0 IF
  DUP 1- MYSELF *
THEN
```

could ask for. The standard screen was:

```
DO LOOP
IF ELSE THEN
BEGIN UNTIL
BEGIN WHILE REPEAT
```

CASE is not standard but can be easily implemented. Using such structures with the proper "word" system, it is remarkably easy to develop a linear approach to programming. We have reasons to use satisfactorily constructs such as GOTO. In addition, the ability to use words is conducive to the analysis of a problem by use of top-down design.

Here are a couple of further examples. Listing 2 shows a routine for the calculation of the factorial of a number. The routine is recursive in that it calls itself via the word MYSELF.

3. If the number is greater than one the routine calls itself.
4. If the number is equal to one, the results of each call itself are multiplied together.

You might find it interesting to compare Basic routines to do the job to Listing 2.

Listing 3 also uses recursion. Can you sort out what it does?

Listing 4 gives a final example. This time I have a real application. Three example screens are shown for a menu system on a Tandy, TRS-80 BM, I using an AY-3-8910. Don't try to understand how it works - simply consider how neat the lay out is and how unlike a normal program it is. The use of normal English gives a user-friendly program which is easily altered by another user.

Listing 2

```
TEST (n - n)
DUP <
IF
  SWAP MYSELF
ELSE
  DUP 0=
  IF
    DROP
  ELSE
    SWAP OVER MOD MYSELF
  THEN
THEN
```

```

Listing 4
Screen 1
(Words for AB-3-8000 Programmable Based Generator)
VOCABULARY WORDS WORD DEFINITIONS SEE P 2 LONG ( FWD Words )
VARIABLE TEMPO 10 TEMPO 1
ON 354 7 *PBC , VOLUME 8*PBC , 3 VOLUME
FWD CREATE , WORDS 8 254 /PBC
      2 1 (ing has use by NOTED ) ,
NOTED HW , ONOTED changes flag value left by a note 1
3400 FWD ON 1435 FWD CPO 1335 FWD SO
3540 FWD SO 1150 FWD SO 1175 FWD FO
3540 FWD FWD 1000 FWD SO 344 FWD AND
PBC FWD AS 551 FWD SO 354 FWD SI
344 FWD CO 354 FWD CPO 347 FWD SI
870 FWD SI 354 FWD SI 347 FWD SI
517 FWD PBC 340 FWD SI 47 FWD AS-2
443 FWD AS 420 FWD SI 354 FWD SO

```

What's Available

So you've had the sales pitch and you're looking to start looking at FORTH. There remains the question as to what is available.

First, there is the software. The first point to make is that FORTH users are a sensible lot when it comes to making systems available and it should be a simple matter to get hold of a public domain system. Try contacting the FORTH Internet Group. Alternatively, there are a few systems which can be obtained for cash.

Probably the most powerful system is *Phar Lightning* from Cams. This was marketed as a generic package and consequently offers a large number of peripheral extensions. Both virtual memory on disk and RAM disk versions are available. Highly recommended.

Melbourne House publishes *Abacus's JAG FORTH* for the 64. This offers some graphics extensions but is otherwise quite standard. Although it is simple to transfer it to disk, only RAM-disk is supported.

ROMIE (now defunct) offers up to 16 FORTH. This is quite a decent version and, if you shop around, you may pick it up cheap.

There are also versions from MPIC and FORTHWIT but I have not collected either.

If you're really lost, steady and help, you might be able to pick up a

Japaner Ace. For you who haven't heard of it the *Japaner Ace* was a FORTH based game rather in the mould of the ZX81 (try *Boldfield Ltd Computing*).

Unfortunately, the instructions, with most low cost FORTHs, are poor and must be supplemented by bookwork. The range of books is wide (the FORTH Internet Group has a

bibliography) but few are worthy of comment. Most are by the same author, Les Maden. *Learning FORTH*, Prentice Hall, ISBN 0-13-042923-7, *Using FORTH*, Prentice Hall, ISBN 0-13-907362-7.

Both are worth reading to get serious computer user's theory and case for users of all abilities.

I hope you have found this brief overview of FORTH of value. Unlike many languages, FORTH has the power and flexibility to grow with your own abilities and provide an effective and elegant solution to your programming problems. **RE**

Touching

Boldfield Ltd Computing Systems
Phone: *Webcam St. Cambridge*
FORTH Internet Group Colton Walk
34 Wild Brn, *Walsingham, Norfolk*
NR11 4JL

FORTHWIT 11 *Beckley Moor Rd*
Burleigh Langshill GL11 7AY
Microprocessor Engineering Ltd, 11
Water Road Slacks, Southampton
SO9 1AP

Melbourne House High Street
Newmarket Road, Newmarket
Cambs. Cambs NG1 4DL
Game Systems, 12 Melville Rd
Weymouth Super Mart Area B23 1TG

Screen 2

(Music Vocabulary)

```

1. NOTE CREATE , TEMPO 8 * (change note duration)
      ONOTED 354 7 *PBC , 354 7 *PBC ON
      10 5 DO LOOP OFF
      10 5 DO LOOP
254 NOTE ONOTED 133 NOTE SEMI-ONOTED
34 NOTE HISEM 31 NOTE CATCHNET
34 NOTE ONOTED 4 NOTE SEMI-ONOTED
4 NOTE SEMI-ONOTED-ONOTED 1 NOTE SEMI-ONOTED-ONOTED ONOTED

```

100 TEMPO

```

354 NOTED ONOTED 31 SEMI ONOTED
354 ONOTED 31 ONOTED
C1 ONOTED AND ONOTED 354 CATCHNET
P1 ONOTED C1 ONOTED AND CATCHNET
C1 ONOTED AND ONOTED 354 CATCHNET
354 NOTED ONOTED C1 SEMI-ONOTED
354 NOTED ONOTED C1 SEMI-ONOTED
354 ONOTED 354 ONOTED
C1 ONOTED AND ONOTED 354 CATCHNET
P1 CATCHNET 354 CATCHNET
C1 ONOTED 354 ONOTED

```


Expanding Systems

Many people who bought the Commodore Sound Expander may have found it too much for their novice status. Perhaps this Music Sales Computer Editor will help.

By S.J. Chance

Did you buy a Commodore FM Sound Expander Package earlier this year? Did you thrill to the Country Boyz and Tuba demonstrations? Did you then find that your keyboard didn't quite make their piece, would not allow you to produce anything sounding half as good as what the machine could play on its own? Discouraged, did you give up your Lantz or Play Keyboards music, and leave your IBM investment gathering dust under your bed? If you have answered "yes" to any of the above questions, then hear the good news: the long-awaited Composer/Editor software for the Sound Expander has arrived, and even at the slightly painful price of \$24.95, it's a must.

At the time of writing, only the disk version was available, and that only with a photo-copy of the instruction manual, but a cassette version should be with it soon.

The Composer

The disk contains two separate programs: the FM Composer and the FM Sound Editor. I will deal with the Composer first. This allows you to enter standard musical notation on to a double staff, over one channel. The notes can be input from the external five-octave keyboard, nothing new to MIDI fans, but to those of us who have struggled up through Uli Sunk's *The Music Studio: The Sound System*, even that is a new experience in terms of ease and speed.

Of course, if you don't have the external keyboard, notes can be entered from the computer keyboard, though this is a much more cumbersome way of doing things. Having the computer keyboard operating as a remote keyboard does mean that a lot of other functions are relegated to the remaining keys.

Octaved notes, tris, triplets, dynamics, rests and tempo, all are supported by the program, but they are entered via a system of using the function keys to scroll through the options, which I found irritatingly clumsy.

Another minor gripe is that to move the cursor from its beginning of a measure to the end involves it lurching on, through all the measures between which, with a piece of any length, can take a couple of minutes. The thing to do here is to break the music down into smaller sections with the "sequence" option.

Repeats in the music are supported including repeats with different endings, which enables one to make up an air set of memory space, now that the program doesn't have plenty of RAM available.

Once entered, your music can be moved fairly to disk from the disk version, edited, and dumped to a Printer. The Print-out is more readable than some, and doesn't have the problem of over-lapping quavers appearing to be semi-quavers which occurs with *The Music Studio*.

The music can be played back, in

whole or in part, at any speed, and in any of 64 different voices.

The Editor

Moving on to the Sound Editor, this does exactly what it says it does. The sounds from the existing library can be altered, or new ones created. There are quite a few parameters to muck about with, and you don't have to have a clue what you are doing to get some interesting results. If you are short on inspiration, there is also a First Machine option which sets-up the Parameters at random.

The sounds can be played from the external keyboard, and it is possible to set a keyboard of up to 128 notes in any way with the original Sound Expander Package. There are also two extra sets of voices which were omitted from the cassette version of the original Sound Expander software.

Also within the editor program is a crude drum machine, using five drums over 32 program steps. This is not as sophisticated as sound or programming on dedicated drum machines add-on, but is quite respectable nonetheless.

Both the Composer and Editor use MIDI compatible through a software interface. If making about MIDI has given you a headache in the past, using both these programs with the Sound Expander may well open your ears and eventually your wallet, to the potential that MIDI provides. **TE**

Letter Writer

If you write a lot of letters and get fed up of using boring paper and pen, try this novel way to communicate with fellow C64 owners.

Figure 1 consists of four bar charts labeled (a) through (d), each showing the percentage of respondents for different age groups across various demographic categories. The age groups are 18-24, 25-34, 35-44, 45-54, 55-64, and 65+.

(a) Gender: The percentage of respondents for each age group is approximately: 18-24 (10%), 25-34 (15%), 35-44 (20%), 45-54 (25%), 55-64 (30%), and 65+ (35%).

(b) Education: The percentage of respondents for each age group is approximately: 18-24 (10%), 25-34 (15%), 35-44 (20%), 45-54 (25%), 55-64 (30%), and 65+ (35%).

(c) Income: The percentage of respondents for each age group is approximately: 18-24 (10%), 25-34 (15%), 35-44 (20%), 45-54 (25%), 55-64 (30%), and 65+ (35%).

(d) Employment: The percentage of respondents for each age group is approximately: 18-24 (10%), 25-34 (15%), 35-44 (20%), 45-54 (25%), 55-64 (30%), and 65+ (35%).

The system provides a novel way to send a letter, or indeed any form of correspondence, to a friend or fellow fid ear by providing a musical accompaniment to a text-type format.

Using the Program

Simple type in your letter uses the keyboard using all normal point commands to make alterations or emphasize parts of text or different text entirely. In fact, the circumstances

quite pleasing results can be achieved, the container can also be used to direct specific waste streams into bins.

When you are quite satisfied with the finished product in the F1 key, press to initiate the save process. The software for text, music and graphics starts to start off. Then, with a collection program to save a single file of 18 blocks in memory.

The program starts with a hard disk or tape, the device being selected by mounting the current contents of SRA.

The program can be further
extended by TUBAC/TALC® users.

The museum has length extended to 40m which provides sufficient room for most installations.

The program must be typed correctly on lined and saved prior to running. Error trap controls are included to ensure that the data entered is correct. The program then stores the relevant data as a temporary address of 0000 and when prompted releases the working program tape from 00000 and saves the contents to disk.

[illegible]

[illegible]

1000

[illegible]

various text and word processing, and database
 all form of communication, to a friend
 or fellow SA user by providing a textual
 accompaniment to a tele-text type format.
 simply type in your letter from the
 keyboard, using all normal print commands
 to take advantage of **display** parts of
 text in different text output.
 in fact by experimentation quite
 pleasing results can be achieved; the
 routine can also be used to deal or
 provide simple solution schemes.
usage

Red Boxes

Now there's a home control system available for the C64, which will switch on the kettle and the telly or even warn of intruders

By Mycroft Appleby

Home control has always been promoted as one of the major uses of computers at the coming point. However, in the past home control systems were expensive, difficult to use, and were only available on systems with good, complex interfacing systems like the BBC Micro. More common computers like the Commodore 64 were not really used at all. One unbuffered user port that doubled as an RS232, and an obscure custom serial system, isn't really the stuff that interfacing dreams are made of.

Finally, there is now on the market an easy to use home control system that is available across a range of systems including the Commodore 64. The starter pack for *Red Boxes* integrates the main controller — called 'Red Leader' — and two control units — an infra-red detector (redtree) and a plug scanner (red one). The brains behind the *Red Boxes* is the controller unit 'talking' to all the other units via a modified serial link via the Busac.

Red Leader is a computer in itself comprising a 6502 derivative processor plus the C64, 1K of RAM, and a BBC-like control Basic. The Commodore 64 connects to this and is used as a terminal. The way this is done is extremely clever. A wire is connected to the C64. Press *Busac/Shop* and the Red Leader behaves just like a computer player, sending cassette-type signals to the Commodore 64.

After a short time the terminal program is loaded into the computer and the link between the Red Leader and the Commodore 64 turns into a proper two-way serial link. You will then drop into the control program mode.

That mode is the simplest operating method on the *Red Boxes* system (the other being Red Basic, but more of that later). You are presented with a menu where you can log-on devices (i.e. tell Red Leader that they exist) type in their code addresses, turn them on or off and set them up to turn on or off at specific times. You can even select the input of one to the output of another so that a movement on the infrared detector will activate an alarm for instance.

This program, whilst being extremely simple, is also quite powerful and lets you perform all the major actions that you would want to in a quick and easy manner. However, for examples, make-outs, animations, you need to get down to some planning and programming. For this you need to use Red Basic and probably need to get hold of the *Program Manual* (good value at £9).

Documentation

The manual supplied gives you some simple information on the Basic, but is really aimed at the inexperienced user to get you into more detail about the main program. The *Program Manual*

on the other hand, is one of the better items that I have read. Going into enough detail for the experienced programmer, but to the beginner who is not familiar with Commodore Basic and wants to get down to using Red Basic.

If you have ever used a BBC micro you will be immediately used to Red Basic as Red Basic is a subset of BBC Basic, with a lot of extra commands added to handle the control aspect of the system. If you think that Red Basic being the same as BBC Basic is a little strange, then you won't when you hear about the Founder of General Information Systems (the people who make Red Boxes) Chris Curry (for it is he) started Acorn way years ago and this is one of the first projects that he has embarked on since the Acorn days up.

As well as most of the BBC Basic commands and annotations — which includes most of the structured programming aids (repeat, goto, name, long variable names etc.) there are commands to log-on devices and manipulate them. As this Basic is a lot more advanced than the Commodore 64 Basic, you should have no trouble at all in telling units to do whatever you want, especially with the red-tree controls. There are commands that are very similar to some commands on the *Amstrad*. Subsets of programs are executed when an external device activates them. So if the timer section of your program is controlling the

beeping and a beeper light the infrared motion detector than the 'alarm' section of your program can be activated.

OK, may not sound like a lot, but try and think of the last time that you wrote a program that was actually 8K in length. Remember, you don't have to worry about errors or colour memory, or sprites, or sound. The Commodore 64 handles all of that. And if Basic is a bit tight you can always switch to machine code.

The Red Leader uses a 6502 processor, and you can program it in machine code by poking code into memory and then executing it. The Project manual carries a list of operating system functions which are very similar to a lot of ways to the Commodore Kernel system. The Basic has the same memory management stuff as the original BBC Basic with pointer variables like Page and Top to indicate when the Basic program is going to sit, and Locomot and Hammer to reserve space for the machine code bits. The operating system and memory areas are also very similar to the BBC, even down to where the system memory ends.

The Basic can also save any programs written under it to a tape connected to the Commodore 64. To do this, the Red Leader first transfers the contents of its memory to the C64. You must then disconnect Red Leader and connect up a tape recorder, and write to tape. Then re-connect everything up.

The main plug of the system is that, when you have a program debugged and working to your satisfaction, you can unplug the Commodore 64 from Red Leader completely and use it for something else or whatever. Yet Red Leader will just sit there executing your programs faster. However, you can leave your Commodore 64 connected if you want to — if you want to see information displayed on the screen for instance — though the power consumption over a period of time would be offputting. The Red Leader on its own uses up very little power, and it is feasible to leave it switched on all the time.

Red One and Two

The two units supplied with the starter pack are Red One and Red Two (which is but the second of the Apocalypse Now). Red One is the

processor. This is a unit that plugs into the system at one end and then has a main socket at the other. Anything you like can be connected to this and turned on and off from Red Leader. There is also a manual override on the unit to toggle it on and off as you are fit. An LED on the box tells you whether it is on or off.

Red Two is an infra-red motion detector. One end plugs into the main (44 pin) and at the other end is a small box about half the size of Red One and Red Leader. In this is a large window. If anything that is at a different temperature than the surrounding air moves within 10 feet of it then a signal is sent back to Red Leader.

All three units come with wall mounting brackets with all screws and fixings, though they don't need to be wall mounted. It is excellent that these are included. The cables are also very long, over six feet in most cases. That is just about the right length. Usually on systems such as these the cables are not quite long enough. I think that they put it right this time.

In the near future CDS will be releasing an alarm unit and an analog input unit. These will allow you to build up an alarm system nearly ready to control a thermostat for heating. Red as has two temperature probes and an RS232 link.

The last unit will allow your computer to talk to a printer or another room, or even another

building, by sending its information down the main line. This could also be used in monitoring computers in a simple and easy manner.

If anyone is worrying about the main system, don't. It is perfectly safe and very well worked out. Each unit has its own unique serial number and the Red Leader has to know what it is. So whilst you could control your own door neighbour's heating system, you'd have to know his encryption code first. However, if you wanted to communicate with a friend down the road, or long as you were on the same hand ring, mine, and within a few hundred yards, you could do it.

Verdict

On the whole this is a brilliant system. One of my main interests as a computer is in the field of remote control. And this is the nearest to use, safety, and most well thought out system that I have ever seen. The only obstacles in its path are public resistance to this sort of thing, and the price which, though low for a control system, is still high for the average Commodore owner. I will watch this with interest.

Teacher

Company: General Information Systems, 1 White Horse Road, London SE1 1NF. **Price:** £125 (starter pack).



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Contributions

*So you own a Commodore? So you've
written some programs? So why haven't you
sent them to us?*

Your Commodore is always on the look out for new programs, hints and tips, articles and even regularities. In fact if you have something that you think could be of use to other Commodore owners, we would be happy about it.

So if you have got something which you think we may be interested in. How do you go about submitting it to us?

Below you will find a list of guidelines that will help us to deal with any item that you send us to us. We don't expect everybody to be the next William Shakespeare but if you do follow these simple rules then it will make our job a lot easier.

1) If possible all material sent to the magazine should be typed or printed out on a computer printer.

2) All text should be double spaced & there should be a blank line between each line of text. You should also leave a margin of about 10 characters around the text.

3) On the very first page you should put the following:

Name of the article
Machine that it is for
Any extras required - disk, printer etc
Your name
Your address
Your telephone number

4) The top of every page should have the following information on it:

Abbreviation of the article title
Your name
The page number

For example, suppose you had submitted an article on C64 in excess. You should put something like the following at the head of the page:

Intermap/J Smith/1

5) Please make sure that you do not make any additional marks on your text especially underlining.

6) Try and write in clear concise English. It does not have to be a work of literature but it must be comprehensible.

7) On the bottom of each page you should put the word **MORE** if there are more pages to the article or **END** if it is the last page.

8) If possible, include a listing of all programs.

9) Under no circumstances use a staple to hold the pages together. Use a paperclip instead.

10) Programs should be included on either disk or tape. Make sure that you **SAVE** two copies of every program so that we have a back-up in case of loading them if problems occur.

11) Programs under 10 lines can be included in the text. If your program is longer than that you must enclose a disk or cassette.

12) If your article needs any artwork then supply clear examples of what is needed. We don't expect you to be an artist but we do need to see what is required.

13) Photographs if necessary, must be either black and white prints or colour slides. We are taking photos out unless we don't worry about the cost much.

14) Submissions of any length are welcome. It is our policy to close review that you think may be of use to someone else we welcome it just as much as a full blown magazine article.

15) Payment varies quite a lot and depends on quite a number of factors such as complexity of program, presentation of program, number of separate pages it takes up etc. Payment is generally between £10.00 and £20.00.

16) All payments are made in the month that the magazine containing your article has appeared in print.

17) If we do find your submission suitable for inclusion in the magazine we will write to you giving the name of the publisher, the rate of payment and an approximate time. Please note that this form will allow us to use your program as soon as possible.

18) If you want the program returned to you, should we find it unsuitable for publication, then you should enclose a stamped and addressed envelope.

19) The last and most important point to make is just writing, we are waiting for your article.

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Listings

Get it right first time with our deluxe program system for the C64.

You may have noticed that our listings use two of those horrible little black boxes which spoil your viewing around the keyboard for a variable graphic symbol. You may also have noticed the figure numbers by the side of each line of the listing. Not to worry, it's all part of our easy entry, and

instead of those nasty graphics and rows of irrelevant spaces in PRINT statements and things we use a special coding system. The whole, as mentioned, is always contained in square brackets and you'll soon learn to decipher their meanings.

For example, [SA] would mean type in a Shifted A, or an any of spaces in Iverson's terms, and [SAH] would mean a row of ten of those symbols.

[S+Z] means hold down the shift key and press the plus key twice. It doesn't take a great leap of logic to realise that [C+Z] means exactly the same thing except that the Commodore key/feature left of the keyboard is held down instead of the shift key.

If more than two spaces appear in a statement then that will be printed as [SPC4] or, equivalently, [SPSPC4]. Translated into English this means press the spacebar four times or to the latter case hold the shift key down while you do it.

A string of typical characters could appear as [CTRL N, DOWNLEFTS BLUE, PACT].

This would be achieved by holding

down the CTRL key as you press N, press the cursor left down twice, the cursor left key five times, press the key marked BLUE while holding down the CTRL key, press the P key and finally hold the Commodore key down while pressing the number two key. [C2] would of course make the computer goot as Iverson!

Always remember that you should only have a row of graphics characters on your screen with no square brackets and no comment unless something like this appears:

[S8] [C+]

In this case the two characters should have a column between them.

On rare occasions [REV T], will appear in a listing. This is a delete symbol and is created by entering the line up to the statement. Then type a closing quotation mark (SHIFT & 2) and delete it. This gives the computer an end of quote mode. Hold down CTRL and press the symbolised and key [RVSDEL], type the relevant number of reversed T's and then hold down CTRL and press zero (RVS0FF). Next type another quotation mark and delete it again. Now finish the line and press RETURN.

A lot of these special cases is given in the table but remember that only one of these statements will appear outside of a PRINT using the symbol for p. This may appear when its value is needed in a calculation in the main loop, something like

CC=2*[PI]*R

Ignore the square brackets and just type an a shifted apostrophe pointing arrow (or the p symbol).

PROGRAM LISTING TABLE	
10 REM *****	DATA CODES
20 POKE 128,128	POKE 128,128
30 POKE 129,129	POKE 129,129
40 POKE 130,130	POKE 130,130
50 POKE 131,131	POKE 131,131
60 POKE 132,132	POKE 132,132
70 POKE 133,133	POKE 133,133
80 POKE 134,134	POKE 134,134
90 POKE 135,135	POKE 135,135
100 POKE 136,136	POKE 136,136
110 POKE 137,137	POKE 137,137
120 POKE 138,138	POKE 138,138
130 POKE 139,139	POKE 139,139
140 POKE 140,140	POKE 140,140
150 POKE 141,141	POKE 141,141
160 POKE 142,142	POKE 142,142
170 POKE 143,143	POKE 143,143
180 POKE 144,144	POKE 144,144
190 POKE 145,145	POKE 145,145
200 POKE 146,146	POKE 146,146
210 POKE 147,147	POKE 147,147
220 POKE 148,148	POKE 148,148
230 POKE 149,149	POKE 149,149
240 POKE 150,150	POKE 150,150
250 POKE 151,151	POKE 151,151
260 POKE 152,152	POKE 152,152
270 POKE 153,153	POKE 153,153
280 POKE 154,154	POKE 154,154
290 POKE 155,155	POKE 155,155
300 POKE 156,156	POKE 156,156
310 POKE 157,157	POKE 157,157
320 POKE 158,158	POKE 158,158
330 POKE 159,159	POKE 159,159
340 POKE 160,160	POKE 160,160
350 POKE 161,161	POKE 161,161
360 POKE 162,162	POKE 162,162
370 POKE 163,163	POKE 163,163
380 POKE 164,164	POKE 164,164
390 POKE 165,165	POKE 165,165
400 POKE 166,166	POKE 166,166
410 POKE 167,167	POKE 167,167
420 POKE 168,168	POKE 168,168
430 POKE 169,169	POKE 169,169
440 POKE 170,170	POKE 170,170
450 POKE 171,171	POKE 171,171
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610 POKE 187,187	POKE 187,187
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640 POKE 190,190	POKE 190,190
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730 POKE 199,199	POKE 199,199
740 POKE 200,200	POKE 200,200
750 POKE 201,201	POKE 201,201
760 POKE 202,202	POKE 202,202
770 POKE 203,203	POKE 203,203
780 POKE 204,204	POKE 204,204
790 POKE 205,205	POKE 205,205
800 POKE 206,206	POKE 206,206
810 POKE 207,207	POKE 207,207
820 POKE 208,208	POKE 208,208
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930 POKE 219,219	POKE 219,219
940 POKE 220,220	POKE 220,220
950 POKE 221,221	POKE 221,221
960 POKE 222,222	POKE 222,222
970 POKE 223,223	POKE 223,223
980 POKE 224,224	POKE 224,224
990 POKE 225,225	POKE 225,225

by Eric Doyle



Checksum Program

The hexadecimal numbers appearing at a column to the left of the listing should not be typed in with the program. There are merely checksum values and are there to help you get each line right. Don't worry if you don't understand the hexadecimal system, as long as you can compare two characters on the screen with the corresponding two characters in the response you can use our line checking program.

Type in the Checksum Program, make sure that you've not made any mistakes and save it to tape or disk

immediately because it will be used with most of the present and future listings appearing in *Your Commodore*.

At the start of each programming session, load Checksum and run it. The screen will start from a welcome line and each time you type a new line and press the RETURN key a number will appear on the screen in white. This should be the same as the corresponding value in the magazine.

If the two values don't agree in one another, you have not copied the line exactly as printed so go back and check each character carefully. When you find the error simply correct it and

press RETURN again.

If you want to turn off the checker simply type SYS40951 and the screen will return to the familiar blue colour. You can then do whatever it was you wanted to do and if this doesn't use the area where Checksum has been you can go back to it with the usual SYS command.

No system is foolproof but the checker of two errors cancelling any further out can be console that we believe our listings are many reliable than any other magazine in the world. So get typing!

22

Mnemonic Symbol Keypress

[RIGHT]		CRSR left/right
[LEFT]		SHIFT & CRSR left/right
[DOWN]		CRSR up/down
[UP]		SHIFT & CRSR up/down
[F1]		F1 key
[F2]		SHIFT & F1 key
[F3]		F3 key
[F4]		SHIFT & F3 key
[F5]		F5 key
[F6]		SHIFT & F5 key
[F7]		F7 key
[F8]		SHIFT & F7 key
[HOME]		CLR/HOME
[CLR]		SHIFT & CLR/HOME
[RVSON]		CTRL & 4
[RVSOFF]		CTRL & 5

Mnemonic Symbol Keypress

[BLACK]		CTRL & 1
[WHITE]		CTRL & 2
[RED]		CTRL & 3
[CYAN]		CTRL & 4
[PURPLE]		CTRL & 5
[GREEN]		CTRL & 6
[BLUE]		CTRL & 7
[YELLOW]		CTRL & 8
[ROUND]		↑
[LARGROW]		←
[UPARROW]		↑
[F1]		SHIFT & ↑
[INST]		SHIFT & INST/DEL
[REV 7]		see text
[Clear]		CRM + letter
[Block]		SHIFT + letter

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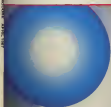
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